



SEQUENCE LISTING

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<110> Colis  
Medina-Selby, Angelica  
Selby, Mark  
Houghton, Michael

<120> NOVEL HCV NON-STRUCTURAL POLYPEPTIDE

<130> PP01617.002

<140> US 09/721,479

<141> 2000-11-22

<160> 19

<170> PatentIn Ver. 2.0

<210> 1

<211> 9620

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

<222> (1990)..(7302)

<220>

<223> Description of Artificial Sequence: Hepatitis C pns345

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Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala		
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Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly		
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Gln Thr Lys Gln Ser Gly Glu	Asn Leu Pro Tyr Leu Val	Ala Tyr Gln													
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ccc ctg cta tac aga ctg ggc	gct gtt cag aat gaa atc	acc ctg acg	3183												
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gtc gtc acg agc acc tgg gtg	ctc gtt ggc ggc gtc ctg	gct gct ttg	3279												
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Gln Thr Asn Trp Gln Lys Leu	Glu Thr Phe Trp Ala Lys	His Met Trp													
515	520	525													



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Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly	
675 680 685	
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Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr		
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Cys	Thr	Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile	Glu	Ala	Asn		

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Arg Arg Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn				
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Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val				
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Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro				
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Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro				
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Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser				
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Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met				
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Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu				
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Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His				
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Lys	Val	Thr	Phe	Asp	Arg	Leu	Gln	Val	Leu	Asp	Ser	His	Tyr	Gln	Asp	
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Val	Leu	Lys	Glu	Val	Lys	Ala	Ala	Ala	Ser	Lys	Val	Lys	Ala	Asn	Leu	
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Ala	Val	Thr	His	Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu	Glu	Asp	Asn	
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Val	Thr	Pro	Ile	Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu	Val	Phe	Cys	
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gtt	cag	cct	gag	aag	ggg	ggt	cgt	aag	cca	gct	cgt	ctc	atc	gtg	ttc	6015
Val	Gln	Pro	Glu	Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	
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ccc	gat	ctg	ggc	gtg	cgc	gtg	tgc	gaa	aag	atg	gct	ttg	tac	gac	gtg	6063
Pro	Asp	Leu	Gly	Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val	
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Val	Thr	Lys	Leu	Pro	Leu	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe	Gln	
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Tyr	Ser	Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala	Trp	Lys	Ser	
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Lys	Lys	Thr	Pro	Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	
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Thr	Val	Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala	Ile	Tyr	Gln	Cys	
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tgt	gac	ctc	gac</													

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Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly	
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Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala	
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Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val	
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Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg Ala	
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Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro	
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Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val	
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Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg	
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Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His	
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Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr	
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ctg tgg gcg agg atg ata ctg atg acc cat ttc ttt agc gtc ctt ata	6831
Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu Ile	
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gcc agg gac cag ctt gaa cag gcc ctc gat tgc gag atc tac ggg gcc	6879
Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile Tyr Gly Ala	
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tgc tac tcc ata gaa cca ctg gat cta cct cca atc att caa aga ctc	6927
Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu	
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cat ggc ctc agc gca ttt tca ctc cac agt tac tct cca ggt gaa atc	6975
His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile	
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aat agg gtg gcc gca tgc ctc aga aaa ctt ggg gta ccg ccc ttg cga	7023
Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg	

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Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg			
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Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val			
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Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp			
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Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His			
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Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu			
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<220>
<223> Description of Artificial Sequence: Hepatitis C pns345

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 Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
                             50                              55                              60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
                             65                              70                              75                              80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
                             85                              90                              95  
 Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
                             100                              105                              110  
 Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
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 Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
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 Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
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 Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
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 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
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 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
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 Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe  
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 Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp  
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 Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn  
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 Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly



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Val Phe Thr Gly	Leu Thr His Ile Asp	Ala His Phe Leu Ser	Gln Thr			
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Lys Gln Ser Gly	Glu Asn Leu Pro Tyr	Leu Val Ala Tyr	Gln Ala Thr			
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Val Cys Ala Arg	Ala Gln Ala Pro Pro Pro	Ser Trp Asp	Gln Met Trp			
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Lys Cys Leu Ile	Arg Leu Lys Pro Thr	Leu His Gly	Pro Thr Pro Leu			
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Leu Tyr Arg Leu	Gly Ala Val Gln Asn	Glu Ile Thr	Leu Thr His Pro			
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Val Thr Lys Tyr	Ile Met Thr Cys Met	Ser Ala Asp	Leu Glu Val Val			
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Thr Ser Thr Trp	Val Leu Val Gly Gly	Val Leu Ala Ala	Leu Ala Ala			
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Tyr Cys Leu Ser	Thr Gly Cys Val Val	Ile Val Gly	Arg Val Val Leu			
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Ser Gly Lys Pro	Ala Ile Ile Pro Asp	Arg Glu Val	Leu Tyr Arg Glu			
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Phe Asp Glu Met	Glu Glu Cys Ser Gln	His Leu Pro Tyr	Ile Glu Gln			
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Gly Met Met Leu	Ala Glu Gln Phe Lys	Gln Lys Ala Leu	Gly Leu Leu			
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Gln Thr Ala Ser	Arg Gln Ala Glu Val	Ile Ala Pro Ala	Val Gln Thr			
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Asn Trp Gln Lys	Leu Glu Thr Phe Trp	Ala Lys His Met	Trp Asn Phe			
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Ile Ser Gly Ile	Gln Tyr Leu Ala Gly	Leu Ser Thr	Leu Pro Gly Asn			
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Pro Ala Ile Ala	Ser Leu Met Ala Phe	Thr Ala Ala Val	Thr Ser Pro			
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Ala Ala Gln Leu	Ala Ala Pro Gly	Ala Ala Thr Ala	Phe Val Gly Ala			
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Gly Leu Ala Gly	Ala Ala Ile Gly	Ser Val Gly	Leu Gly Lys Val Leu			
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 Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val  
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 Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln Val Pro Ser Pro Glu  
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 Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro  
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 Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His  
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 Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val

915	920	925
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Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Val Ala Ser 945 950 955 960		
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Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu 980 985 990		
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Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp 1010 1015 1020		
Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg 1025 1030 1035 1040		
Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro 1045 1050 1055		
Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His 1060 1065 1070		
Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg 1075 1080 1085		
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Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile 1105 1110 1115 1120		
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tattagtcac cgctattacc atggtgatgc ggttttggca gtacaccaat gggcgtggat 840  
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tttggcacca aaatcaacgg gactttccaa aatgtcgtaa taaccccgcc ccgttgacgc 960  
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gatccagcct ccgcgcccgga gaacgggtgca ttggaacgag gattccccgt gccaaagtgt 1140  
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tgtttttggc ttggggccta tacacccccg ctcttatgac tataggtgat ggtatagctt 1260  
agcctatagg tgtgggttat tgaccattat tgaccactcc cctattgggtg acgatacttt 1320  
ccattactaa tccataacat ggctctttgc cacaactatc tctattggct atatgccaat 1380  
actctgtcct tcagagactg acacggactc tgtattttta caggatgggg tccatttatt 1440  
atttacaat tcacatatac aacaacgccc tccccgtgc ccgcagtttt tattaaacat 1500  
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 gtgtgccgca caaggccgtg gcggtagggt atgtgtctga aaatgagctc ggagattggg 1740  
 ctgcacctg gacgcagatg gaagacttaa ggcagcggca gaagaagatg caggcagctg 1800  
 agttgttgta ttctgataag agtcagaggt aactcccgtt gcggtgctgt taacgggtgga 1860  
 gggcagtgtg gtctgagcag tactcgttgc tgccgcgcgc gccaccagac ataatagctg 1920  
 acagactaac agactgttcc tttccatggg tcttttctgc agtcaccgtc gtcgacctaa 1980  
 gaattcacc atg gct gca tat gca gct cag ggc tat aag gtg cta gta ctc 2031  
           Met Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu  
           1                          5                          10  
 aac ccc tct gtt gct gca aca ctg ggc ttt ggt gct tac atg tcc aag 2079  
 Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys  
   15                          20                          25                          30  
 gct cat ggg atc gat cct aac atc agg acc ggg gtg aga aca att acc 2127  
 Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr  
                           35                          40                          45  
 act ggc agc ccc atc acg tac tcc acc tac ggc aag ttc ctt gcc gac 2175  
 Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp  
                           50                          55                          60  
 ggc ggg tgc tcg ggg ggc gct tat gac ata ata att tgt gac gag tgc 2223  
 Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys  
                           65                          70                          75  
 cac tcc acg gat gcc aca tcc atc ttg ggc att ggc act gtc ctt gac 2271  
 His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp  
                           80                          85                          90  
 caa gca gag act gcg ggg gcg aga ctg gtt gtg ctc gcc acc gcc acc 2319  
 Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr  
   95                          100                          105                          110  
 cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc gag gag gtt gct 2367  
 Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala  
                           115                          120                          125  
 ctg tcc acc acc gga gag atc cct ttt tac ggc aag gct atc ccc ctc 2415  
 Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu  
                           130                          135                          140  
 gaa gta atc aag ggg ggg aga cat ctc atc ttc tgt cat tca aag aag 2463  
 Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys  
                           145                          150                          155  
 aag tgc gac gaa ctc gcc gca aag ctg gtc gca ttg ggc atc aat gcc 2511  
 Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala  
   160                          165                          170  
 gtg gcc tac tac cgc ggt ctt gac gtg tcc gtc atc ccg acc agc ggc 2559

Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	
175					180					185					190	
gat	gtt	gtc	gtc	gtg	gca	acc	gat	gcc	ctc	atg	acc	ggc	tat	acc	ggc	2607
Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Tyr	Thr	Gly	
				195					200					205		
gac	ttc	gac	tcg	gtg	ata	gac	tgc	aat	acg	tgt	gtc	acc	cag	aca	gtc	2655
Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	
			210					215					220			
gat	ttc	agc	ctt	gac	cct	acc	ttc	acc	att	gag	aca	atc	acg	ctc	ccc	2703
Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Ile	Thr	Leu	Pro	
		225					230					235				
caa	gat	gct	gtc	tcc	cgc	act	caa	cgt	cgg	ggc	agg	act	ggc	agg	ggg	2751
Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	
	240					245					250					
aag	cca	ggc	atc	tac	aga	ttt	gtg	gca	ccg	ggg	gag	cgc	ccc	tcc	ggc	2799
Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	Glu	Arg	Pro	Ser	Gly	
255					260					265					270	
atg	ttc	gac	tcg	tcc	gtc	ctc	tgt	gag	tgc	tat	gac	gca	ggc	tgt	gct	2847
Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	
				275					280					285		
tgg	tat	gag	ctc	acg	ccc	gcc	gag	act	aca	gtt	agg	cta	cga	gcg	tac	2895
Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu	Arg	Ala	Tyr	
			290					295					300			
atg	aac	acc	ccg	ggg	ctt	ccc	gtg	tgc	cag	gac	cat	ctt	gaa	ttt	tgg	2943
Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	
		305					310					315				
gag	ggc	gtc	ttt	aca	ggc	ctc	act	cat	ata	gat	gcc	cac	ttt	cta	tcc	2991
Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	
	320					325					330					
cag	aca	aag	cag	agt	ggg	gag	aac	ctt	cct	tac	ctg	gta	gcg	tac	caa	3039
Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	
335					340					345					350	
gcc	acc	gtg	tgc	gct	agg	gct	caa	gcc	cct	ccc	cca	tcg	tgg	gac	cag	3087
Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	
				355					360					365		
atg	tgg	aag	tgt	ttg	att	cgc	ctc	aag	ccc	acc	ctc	cat	ggg	cca	aca	3135
Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	
			370					375					380			
ccc	ctg	cta	tac	aga	ctg	ggc	gct	gtt	cag	aat	gaa	atc	acc	ctg	acg	3183
Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Ile	Thr	Leu	Thr	
		385					390					395				
cac	cca	gtc	acc	aaa	tac	atc	atg	aca	tgc	atg	tcg	gcc	gac	ctg	gag	3231
His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	



400	405	410	
gtc gtc acg agc acc tgg gtg ctc gtt ggc ggc gtc ctg gct gct ttg Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu 415 420 425 430			3279
gcc gcg tat tgc ctg tca aca ggc tgc gtg gtc ata gtg ggc agg gtc Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Val 435 440 445			3327
gtc ttg tcc ggg aag ccg gca atc ata cct gac agg gaa gtc ctc tac Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr 450 455 460			3375
cga gag ttc gat gag atg gaa gag tgc tct cag cac tta ccg tac atc Arg Glu Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu Pro Tyr Ile 465 470 475			3423
gag caa ggg atg atg ctc gcc gag cag ttc aag cag aag gcc ctc ggc Glu Gln Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly 480 485 490			3471
ctc ctg cag acc gcg tcc cgt cag gca gag gtt atc gcc cct gct gtc Leu Leu Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala Pro Ala Val 495 500 505 510			3519
cag acc aac tgg caa aaa ctc gag acc ttc tgg gcg aag cat atg tgg Gln Thr Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys His Met Trp 515 520 525			3567
aac ttc atc agt ggg ata caa tac ttg gcg ggc ttg tca acg ctg cct Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro 530 535 540			3615
ggc aac ccc gcc att gct tca ttg atg gct ttt aca gct gct gtc acc Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ala Val Thr 545 550 555			3663
agc cca cta acc act agc caa acc ctc ctc ttc aac ata ttg ggg ggg Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly 560 565 570			3711
tgg gtg gct gcc cag ctc gcc gcc ccc ggt gcc gct act gcc ttt gtg Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr Ala Phe Val 575 580 585 590			3759
ggc gct ggc tta gct ggc gcc gcc atc ggc agt gtt gga ctg ggg aag Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly Leu Gly Lys 595 600 605			3807
gtc ctc ata gac atc ctt gca ggg tat ggc gcg ggc gtg gcg gga gct Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala 610 615 620			3855
ctt gtg gca ttc aag atc atg agc ggt gag gtc ccc tcc acg gag gac Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu Asp 625 630 635			3903

ctg gtc aat cta ctg ccc gcc atc ctc tcg ccc gga gcc ctc gta gtc	3951
Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val	
640 645 650	
ggc gtg gtc tgt gca gca ata ctg cgc cgg cac gtt ggc ccg ggc gag	3999
Gly Val Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu	
655 660 665 670	
ggg gca gtg cag tgg atg aac cgg ctg ata gcc ttc gcc tcc cgg ggg	4047
Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly	
675 680 685	
aac cat gtt tcc ccc acg cac tac gtg ccg gag agc gat gca gct gcc	4095
Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala	
690 695 700	
cgc gtc act gcc ata ctc agc agc ctc act gta acc cag ctc ctg agg	4143
Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln Leu Leu Arg	
705 710 715	
cga ctg cac cag tgg ata agc tcg gag tgt acc act cca tgc tcc ggt	4191
Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly	
720 725 730	
tcc tgg cta agg gac atc tgg gac tgg ata tgc gag gtg ttg agc gac	4239
Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val Leu Ser Asp	
735 740 745 750	
ttt aag acc tgg cta aaa gct aag ctc atg cca cag ctg cct ggg atc	4287
Phe Lys Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly Ile	
755 760 765	
ccc ttt gtg tcc tgc cag cgc ggg tat aag ggg gtc tgg cga ggg gac	4335
Pro Phe Val Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp	
770 775 780	
ggc atc atg cac act cgc tgc cac tgt gga gct gag atc act gga cat	4383
Gly Ile Met His Thr Arg Cys His Cys Gly Ala Glu Ile Thr Gly His	
785 790 795	
gtc aaa aac ggg acg atg agg atc gtc ggt cct agg acc tgc agg aac	4431
Val Lys Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr Cys Arg Asn	
800 805 810	
atg tgg agt ggg acc ttc ccc att aat gcc tac acc acg ggc ccc tgt	4479
Met Trp Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys	
815 820 825 830	
acc ccc ctt cct gcg ccg aac tac acg ttc gcg cta tgg agg gtg tct	4527
Thr Pro Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp Arg Val Ser	
835 840 845	
gca gag gaa tac gtg gag ata agg cag gtg ggg gac ttc cac tac gtg	4575
Ala Glu Glu Tyr Val Glu Ile Arg Gln Val Gly Asp Phe His Tyr Val	
850 855 860	
acg ggt atg act act gac aat ctt aaa tgc ccg tgc cag gtc cca tcg	4623

Thr	Gly	Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ser	
		865					870					875				
ccc	gaa	ttt	ttc	aca	gaa	ttg	gac	ggg	gtg	cgc	cta	cat	agg	ttt	gcg	4671
Pro	Glu	Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His	Arg	Phe	Ala	
	880					885					890					
ccc	ccc	tgc	aag	ccc	ttg	ctg	cgg	gag	gag	gta	tca	ttc	aga	gta	gga	4719
Pro	Pro	Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe	Arg	Val	Gly	
	895				900					905					910	
ctc	cac	gaa	tac	ccg	gta	ggg	tcg	caa	tta	cct	tgc	gag	ccc	gaa	ccg	4767
Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	
				915					920					925		
gac	gtg	gcc	gtg	ttg	acg	tcc	atg	ctc	act	gat	ccc	tcc	cat	ata	aca	4815
Asp	Val	Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	
			930					935					940			
gca	gag	gcg	gcc	ggg	cga	agg	ttg	gcg	agg	gga	tca	ccc	ccc	tct	gtg	4863
Ala	Glu	Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Val	
	945						950					955				
gcc	agc	tcc	tcg	gct	agc	cag	cta	tcc	gct	cca	tct	ctc	aag	gca	act	4911
Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	
	960					965				970						
tgc	acc	gct	aac	cat	gac	tcc	cct	gat	gct	gag	ctc	ata	gag	gcc	aac	4959
Cys	Thr	Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile	Glu	Ala	Asn	
	975				980					985					990	
ctc	cta	tgg	agg	cag	gag	atg	ggc	ggc	aac	atc	acc	agg	gtt	gag	tca	5007
Leu	Leu	Trp	Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	
				995				1000					1005			
gaa	aac	aaa	gtg	gtg	att	ctg	gac	tcc	ttc	gat	ccg	ctt	gtg	gcg	gag	5055
Glu	Asn	Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Asp	Pro	Leu	Val	Ala	Glu	
		1010						1015				1020				
gag	gac	gag	cgg	gag	atc	tcc	gta	ccc	gca	gaa	atc	ctg	cgg	aag	tct	5103
Glu	Asp	Glu	Arg	Glu	Ile	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Lys	Ser	
	1025					1030					1035					
cgg	aga	ttc	gcc	cag	gcc	ctg	ccc	gtt	tgg	gcg	cgg	ccg	gac	tat	aac	5151
Arg	Arg	Phe	Ala	Gln	Ala	Leu	Pro	Val	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	
	1040				1045					1050						
ccc	ccg	cta	gtg	gag	acg	tgg	aaa	aag	ccc	gac	tac	gaa	cca	cct	gtg	5199
Pro	Pro	Leu	Val	Glu	Thr	Trp	Lys	Lys	Pro	Asp	Tyr	Glu	Pro	Pro	Val	
	1055				1060				1065					1070		
gtc	cat	ggc	tgc	ccg	ctt	cca	cct	cca	aag	tcc	cct	cct	gtg	cct	ccg	5247
Val	His	Gly	Cys	Pro	Leu	Pro	Pro	Pro	Lys	Ser	Pro	Pro	Val	Pro	Pro	
				1075				1080					1085			
cct	cgg	aag	aag	cgg	acg	gtg	gtc	ctc	act	gaa	tca	acc	cta	tct	act	5295
Pro	Arg	Lys	Lys	Arg	Thr	Val	Val	Leu	Thr	Glu	Ser	Thr	Leu	Ser	Thr	

1090	1095	1100	
gcc ttg gcc gag ctc gcc acc aga agc ttt ggc agc tcc tca act tcc			5343
Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser			
1105	1110	1115	
ggc att acg ggc gac aat acg aca aca tcc tct gag ccc gcc cct tct			5391
Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser			
1120	1125	1130	
ggc tgc ccc ccc gac tcc gac gct gag tcc tat tcc tcc atg ccc ccc			5439
Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro			
1135	1140	1145	1150
ctg gag ggg gag cct ggg gat ccg gat ctt agc gac ggg tca tgg tca			5487
Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser			
1155	1160	1165	
acg gtc agt agt gag gcc aac gcg gag gat gtc gtg tgc tgc tca atg			5535
Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met			
1170	1175	1180	
tct tac tct tgg aca ggc gca ctc gtc acc ccg tgc gcc gcg gaa gaa			5583
Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu			
1185	1190	1195	
cag aaa ctg ccc atc aat gca cta agc aac tcg ttg cta cgt cac cac			5631
Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His			
1200	1205	1210	
aat ttg gtg tat tcc acc acc tca cgc agt gct tgc caa agg cag aag			5679
Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys			
1215	1220	1225	1230
aaa gtc aca ttt gac aga ctg caa gtt ctg gac agc cat tac cag gac			5727
Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp			
1235	1240	1245	
gta ctc aag gag gtt aaa gca gcg gcg tca aaa gtg aag gct aac ttg			5775
Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn Leu			
1250	1255	1260	
cta tcc gta gag gaa gct tgc agc ctg acg ccc cca cac tca gcc aaa			5823
Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys			
1265	1270	1275	
tcc aag ttt ggt tat ggg gca aaa gac gtc cgt tgc cat gcc aga aag			5871
Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg Lys			
1280	1285	1290	
gcc gta acc cac atc aac tcc gtg tgg aaa gac ctt ctg gaa gac aat			5919
Ala Val Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu Glu Asp Asn			
1295	1300	1305	1310
gta aca cca ata gac act acc atc atg gct aag aac gag gtt ttc tgc			5967
Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys			
1315	1320	1325	

gtt cag cct gag aag ggg ggt cgt aag cca gct cgt ctc atc gtg ttc	6015
Val Gln Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe	
1330 1335 1340	
ccc gat ctg ggc gtg cgc gtg tgc gaa aag atg gct ttg tac gac gtg	6063
Pro Asp Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val	
1345 1350 1355	
gtt aca aag ctc ccc ttg gcc gtg atg gga agc tcc tac gga ttc caa	6111
Val Thr Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr Gly Phe Gln	
1360 1365 1370	
tac tca cca gga cag cgg gtt gaa ttc ctc gtg caa gcg tgg aag tcc	6159
Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala Trp Lys Ser	
1375 1380 1385 1390	
aag aaa acc cca atg ggg ttc tgc tat gat acc cgc tgc ttt gac tcc	6207
Lys Lys Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser	
1395 1400 1405	
aca gtc act gag agc gac atc cgt acg gag gag gca atc tac caa tgt	6255
Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys	
1410 1415 1420	
tgt gac ctc gac ccc caa gcc cgc gtg gcc atc aag tcc ctc acc gag	6303
Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr Glu	
1425 1430 1435	
agg ctt tat gtt ggg ggc cct ctt acc aat tca agg ggg gag aac tgc	6351
Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys	
1440 1445 1450	
ggc tat cgc agg tgc cgc gcg agc ggc gta ctg aca act agc tgt ggt	6399
Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly	
1455 1460 1465 1470	
aac acc ctc act tgc tac atc aag gcc cgg gca gcc tgt cga gcc gca	6447
Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala	
1475 1480 1485	
ggg ctc cag gac tgc acc atg ctc gtg tgt ggc gac gac tta gtc gtt	6495
Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val	
1490 1495 1500	
atc tgt gaa agc gcg ggg gtc cag gag gac gcg gcg agc ctg aga gcc	6543
Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg Ala	
1505 1510 1515	
ttc acg gag gct atg acc agg tac tcc gcc ccc cct ggg gac ccc cca	6591
Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro	
1520 1525 1530	
caa cca gaa tac gac ttg gag ctc ata aca tca tgc tcc tcc aac gtg	6639
Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val	
1535 1540 1545 1550	
tca gtc gcc cac gac ggc gct gga aag agg gtc tac tac ctc acc cgt	6687

Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg  
 1555 1560 1565  
 gac cct aca acc ccc ctc gcg aga gct gcg tgg gag aca gca aga cac 6735  
 Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His  
 1570 1575 1580  
 act cca gtc aat tcc tgg cta ggc aac ata atc atg ttt gcc ccc aca 6783  
 Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr  
 1585 1590 1595  
 ctg tgg gcg agg atg ata ctg atg acc cat ttc ttt agc gtc ctt ata 6831  
 Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu Ile  
 1600 1605 1610  
 gcc agg gac cag ctt gaa cag gcc ctc gat tgc gag atc tac ggg gcc 6879  
 Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile Tyr Gly Ala  
 1615 1620 1625 1630  
 tgc tac tcc ata gaa cca ctg gat cta cct cca atc att caa aga ctc 6927  
 Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu  
 1635 1640 1645  
 cat ggc ctc agc gca ttt tca ctc cac agt tac tct cca ggt gaa atc 6975  
 His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile  
 1650 1655 1660  
 aat agg gtg gcc gca tgc ctc aga aaa ctt ggg gta ccg ccc ttg cga 7023  
 Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg  
 1665 1670 1675  
 gct tgg aga cac cgg gcc cgg agc gtc cgc gct agg ctt ctg gcc aga 7071  
 Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg  
 1680 1685 1690  
 gga ggc agg gct gcc ata tgt ggc aag tac ctc ttc aac tgg gca gta 7119  
 Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val  
 1695 1700 1705 1710  
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 Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp  
 1715 1720 1725  
 ttg tcc ggc tgg ttc acg gct ggc tac agc ggg gga gac att tat cac 7215  
 Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His  
 1730 1735 1740  
 agc gtg tct cat gcc cgg ccc cgc tgg atc tgg ttt tgc cta ctc ctg 7263  
 Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu  
 1745 1750 1755  
 ctt gct gca ggg gta ggc atc tac ctc ctc ccc aac cga tgaaggttg 7312  
 Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg  
 1760 1765 1770  
 ggtaaacact ccggcctaaa aaaaaaaaaa aatctagaaa ggcgcgccaa gatatcaagg 7372

atccactacg cgttagagct cgctgatcag cctcgactgt gccttctagt tgccagccat 7432  
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<211> 1771  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: pDeltaNS3NS5

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Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly  
35 40 45  
Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
50 55 60  
Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
65 70 75 80  
Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
85 90 95  
Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
100 105 110  
Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
115 120 125  
Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
130 135 140  
Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
145 150 155 160



Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
 165 170 175  
 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
 180 185 190  
 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
 195 200 205  
 Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe  
 210 215 220  
 Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp  
 225 230 235 240  
 Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro  
 245 250 255  
 Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe  
 260 265 270  
 Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr  
 275 280 285  
 Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn  
 290 295 300  
 Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly  
 305 310 315 320  
 Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr  
 325 330 335  
 Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val Ala Tyr Gln Ala Thr  
 340 345 350  
 Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp  
 355 360 365  
 Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu  
 370 375 380  
 Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Ile Thr Leu Thr His Pro  
 385 390 395 400  
 Val Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val  
 405 410 415  
 Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala  
 420 425 430  
 Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Val Val Leu  
 435 440 445  
 Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu  
 450 455 460

Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln  
465 470 475 480  
Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu  
485 490 495  
Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala Pro Ala Val Gln Thr  
500 505 510  
Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys His Met Trp Asn Phe  
515 520 525  
Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn  
530 535 540  
Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro  
545 550 555 560  
Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val  
565 570 575  
Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala  
580 585 590  
Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu  
595 600 605  
Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val  
610 615 620  
Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val  
625 630 635 640  
Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val  
645 650 655  
Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala  
660 665 670  
Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His  
675 680 685  
Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val  
690 695 700  
Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu  
705 710 715 720  
His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp  
725 730 735  
Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys  
740 745 750  
Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe  
755 760 765

Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	
770							775					780				
Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile	Thr	Gly	His	Val	Lys	
785					790					795					800	
Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Arg	Asn	Met	Trp	
				805					810					815		
Ser	Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	
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Leu	Pro	Ala	Pro	Asn	Tyr	Thr	Phe	Ala	Leu	Trp	Arg	Val	Ser	Ala	Glu	
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Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	
	850					855					860					
Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ser	Pro	Glu	
865					870					875					880	
Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His	Arg	Phe	Ala	Pro	Pro	
				885					890					895		
Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe	Arg	Val	Gly	Leu	His	
			900					905					910			
Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	
		915					920					925				
Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	
	930					935					940					
Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Val	Ala	Ser	
945					950					955					960	
Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	
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Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile	Glu	Ala	Asn	Leu	Leu	
			980					985					990			
Trp	Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	
		995					1000					1005				
Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Asp	Pro	Leu	Val	Ala	Glu	Glu	Asp	
	1010					1015					1020					
Glu	Arg	Glu	Ile	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Lys	Ser	Arg	Arg	
1025					1030					1035					1040	
Phe	Ala	Gln	Ala	Leu	Pro	Val	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	
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Leu	Val	Glu	Thr	Trp	Lys	Lys	Pro	Asp	Tyr	Glu	Pro	Pro	Val	Val	His	
			1060					1065					1070			

Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg  
 1075 1080 1085  
 Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu  
 1090 1095 1100  
 Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile  
 1105 1110 1115 1120  
 Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys  
 1125 1130 1135  
 Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu  
 1140 1145 1150  
 Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val  
 1155 1160 1165  
 Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met Ser Tyr  
 1170 1175 1180  
 Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys  
 1185 1190 1195 1200  
 Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu  
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 Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val  
 1220 1225 1230  
 Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu  
 1235 1240 1245  
 Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser  
 1250 1255 1260  
 Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys  
 1265 1270 1275 1280  
 Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val  
 1285 1290 1295  
 Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu Glu Asp Asn Val Thr  
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 Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln  
 1315 1320 1325  
 Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp  
 1330 1335 1340  
 Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Thr  
 1345 1350 1355 1360  
 Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser  
 1365 1370 1375

Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys  
 1380 1385 1390  
 Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val  
 1395 1400 1405  
 Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp  
 1410 1415 1420  
 Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu  
 1425 1430 1435 1440  
 Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr  
 1445 1450 1455  
 Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr  
 1460 1465 1470  
 Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu  
 1475 1480 1485  
 Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys  
 1490 1495 1500  
 Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr  
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 Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro  
 1525 1530 1535  
 Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val  
 1540 1545 1550  
 Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro  
 1555 1560 1565  
 Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro  
 1570 1575 1580  
 Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp  
 1585 1590 1595 1600  
 Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg  
 1605 1610 1615  
 Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile Tyr Gly Ala Cys Tyr  
 1620 1625 1630  
 Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly  
 1635 1640 1645  
 Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg  
 1650 1655 1660  
 Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp  
 1665 1670 1675 1680

Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg Gly Gly  
 1685 1690 1695  
 Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr  
 1700 1705 1710  
 Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp Leu Ser  
 1715 1720 1725  
 Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val  
 1730 1735 1740  
 Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu Leu Ala  
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<211> 4282

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pCMVII

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<220>  
<223> Description of Artificial Sequence: pNS34a

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1 5 10

cta ggg tgc ata atc acc agc cta act ggc cgg gac aaa aac caa gtg 2079  
Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val  
15 20 25 30

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Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala  
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acg tgc atc aat ggg gtg tgc tgg act gtc tac cac ggg gcc gga acg 2175  
Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr  
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agg acc atc gcg tca ccc aag ggt cct gtc atc cag atg tat acc aat 2223  
Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn  
65 70 75

gta gac caa gac ctt gtg ggc tgg ccc gct tcg caa ggt acc cgc tca 2271  
Val Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser  
80 85 90

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Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg  
95 100 105 110

cac gcc gat gtc att ccc gtg cgc cgg cgg ggt gat agc agg ggc agc 2367  
His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser  
115 120 125

ctg ctg tcg ccc cgg ccc att tcc tac ttg aaa ggc tcc tcg ggg ggt 2415  
Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly  
130 135 140

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Pro	Leu	Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	
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gtg	tgc	acc	cgt	gga	gtg	gct	aag	gcg	gtg	gac	ttt	atc	cct	gtg	gag	2511
Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	
	160					165					170					
aac	cta	gag	aca	acc	atg	agg	tcc	ccg	gtg	ttc	acg	gat	aac	tcc	tct	2559
Asn	Leu	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	
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cca	cca	gta	gtg	ccc	cag	agc	ttc	cag	gtg	gct	cac	ctc	cat	gct	ccc	2607
Pro	Pro	Val	Val	Pro	Gln	Ser	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	
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aca	ggc	agc	ggc	aaa	agc	acc	aag	gtc	ccg	gct	gca	tat	gca	gct	cag	2655
Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	
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Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	
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ttt	ggt	gct	tac	atg	tcc	aag	gct	cat	ggg	atc	gat	cct	aac	atc	agg	2751
Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	
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acc	ggg	gtg	aga	aca	att	acc	act	ggc	agc	ccc	atc	acg	tac	tcc	acc	2799
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tac	ggc	aag	ttc	ctt	gcc	gac	ggc	ggg	tgc	tcg	ggg	ggc	gct	tat	gac	2847
Tyr	Gly	Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	
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ata	ata	att	tgt	gac	gag	tgc	cac	tcc	acg	gat	gcc	aca	tcc	atc	ttg	2895
Ile	Ile	Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	
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Gly	Ile	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	
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gtt	gtg	ctc	gcc	acc	gcc	acc	cct	ccg	ggc	tcc	gtc	act	gtg	ccc	cat	2991
Val	Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	
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ccc	aac	atc	gag	gag	gtt	gct	ctg	tcc	acc	acc	gga	gag	atc	cct	ttt	3039
Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	
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tac	ggc	aag	gct	atc	ccc	ctc	gaa	gta	atc	aag	ggg	ggg	aga	cat	ctc	3087
Tyr	Gly	Lys	Ala	Ile	Pro	Leu	Glu	Val	Ile	Lys	Gly	Gly	Arg	His	Leu	
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atc	ttc	tgt	cat	tca	aag	aag	aag	tgc	gac	gaa	ctc	gcc	gca	aag	ctg	3135

Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu		
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Val	Ala	Leu	Gly	Ile	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val		
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Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala		
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ctc	atg	acc	ggc	tat	acc	ggc	gac	ttc	gac	tcg	gtg	ata	gac	tgc	aat	3279	
Leu	Met	Thr	Gly	Tyr	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn		
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Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr		
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Ile	Glu	Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg		
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Arg	Gly	Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala		
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ccg	ggg	gag	cgc	ccc	tcc	ggc	atg	ttc	gac	tcg	tcc	gtc	ctc	tgt	gag	3471	
Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu		
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Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr		
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Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His		
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Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val			
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ggc ggc gtc ctg gct gct ttg gcc gcg tat tgc ctg tca aca ggc tgc			3951
Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys			
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gtg gtc ata gtg ggc agg gtc gtc ttg tcc ggg aag ccg gca atc ata			3999
Val Val Ile Val Gly Arg Val Val Leu Ser Gly Lys Pro Ala Ile Ile			
655	660	665	670
cct gac agg gaa gtc ctc tac cga gag ttc gat gag atg gaa gag tgc			4047
Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys			
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<210> 7

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pNS34a

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Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys  
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 Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr  
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 Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr  
 85 90 95  
 Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala  
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 Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu  
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 Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu  
 130 135 140  
 Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys  
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 Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu  
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 Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro  
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 Val Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly  
 195 200 205  
 Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr  
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 Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly  
 225 230 235 240  
 Ala Tyr Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly  
 245 250 255  
 Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly  
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 Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile  
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 Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile  
 290 295 300  
 Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val  
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Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly						
10		15		20	25	
gct tac atg tcc aag gct cat ggg atc gat cct aac atc agg acc ggg						12867
Ala Tyr Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly						
	30		35		40	
gtg aga aca att acc act ggc agc ccc atc acg tac tcc acc tac ggc						12915



Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly		
			45					50					55				
aag	ttc	ctt	gcc	gac	ggc	ggg	tgc	tcg	ggg	ggc	gct	tat	gac	ata	ata	12963	
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile		
		60					65					70					
att	tgt	gac	gag	tgc	cac	tcc	acg	gat	gcc	aca	tcc	atc	ttg	ggc	att	13011	
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile		
	75					80					85						
ggc	act	gtc	ctt	gac	caa	gca	gag	act	gcg	ggg	gcg	aga	ctg	gtt	gtg	13059	
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Val	Val		
	90				95					100					105		
ctc	gcc	acc	gcc	acc	cct	ccg	ggc	tcc	gtc	act	gtg	ccc	cat	ccc	aac	13107	
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn		
				110					115					120			
atc	gag	gag	gtt	gct	ctg	tcc	acc	acc	gga	gag	atc	cct	ttt	tac	ggc	13155	
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly		
			125					130					135				
aag	gct	atc	ccc	ctc	gaa	gta	atc	aag	ggg	ggg	aga	cat	ctc	atc	ttc	13203	
Lys	Ala	Ile	Pro	Leu	Glu	Val	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe		
		140					145					150					
tgt	cat	tca	aag	aag	aag	tgc	gac	gaa	ctc	gcc	gca	aag	ctg	gtc	gca	13251	
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala		
	155					160					165						
ttg	ggc	atc	aat	gcc	gtg	gcc	tac	tac	cgc	ggt	ctt	gac	gtg	tcc	gtc	13299	
Leu	Gly	Ile	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val		
	170				175					180					185		
atc	ccg	acc	agc	ggc	gat	gtt	gtc	gtc	gtg	gca	acc	gat	gcc	ctc	atg	13347	
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met		
				190					195					200			
acc	ggc	tat	acc	ggc	gac	ttc	gac	tcg	gtg	ata	gac	tgc	aat	acg	tgt	13395	
Thr	Gly	Tyr	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys		
			205					210					215				
gtc	acc	cag	aca	gtc	gat	ttc	agc	ctt	gac	cct	acc	ttc	acc	att	gag	13443	
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu		
		220					225					230					
aca	atc	acg	ctc	ccc	caa	gat	gct	gtc	tcc	cgc	act	caa	cgt	cgg	ggc	13491	
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly		
	235				240					245							
agg	act	ggc	agg	ggg	aag	cca	ggc	atc	tac	aga	ttt	gtg	gca	ccg	ggg	13539	
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly		
	250				255					260					265		
gag	cgc	ccc	tcc	ggc	atg	ttc	gac	tcg	tcc	gtc	ctc	tgt	gag	tgc	tat	13587	
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr		

270										275					280					
gac	gca	ggc	tgt	gct	tgg	tat	gag	ctc	acg	ccc	gcc	gag	act	aca	gtt	13635				
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val					
285										290					295					
agg	cta	cga	gcg	tac	atg	aac	acc	ccg	ggg	ctt	ccc	gtg	tgc	cag	gac	13683				
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp					
300										305					310					
cat	ctt	gaa	ttt	tgg	gag	ggc	gtc	ttt	aca	ggc	ctc	act	cat	ata	gat	13731				
His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp					
315										320					325					
gcc	cac	ttt	cta	tcc	cag	aca	aag	cag	agt	ggg	gag	aac	ctt	cct	tac	13779				
Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr					
330										335					340					
ctg	gta	gcg	tac	caa	gcc	acc	gtg	tgc	gct	agg	gct	caa	gcc	cct	ccc	13827				
Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro					
350										355					360					
cca	tcg	tgg	gac	cag	atg	tgg	aag	tgt	ttg	att	cgc	ctc	aag	ccc	acc	13875				
Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr					
365										370					375					
ctc	cat	ggg	cca	aca	ccc	ctg	cta	tac	aga	ctg	ggc	gct	gtt	cag	aat	13923				
Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn					
380										385					390					
gaa	atc	acc	ctg	acg	cac	cca	gtc	acc	aaa	tac	atc	atg	aca	tgc	atg	13971				
Glu	Ile	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met					
395										400					405					
tcg	gcc	gac	ctg	gag	gtc	gtc	acg	agc	acc	tgg	gtg	ctc	gtt	ggc	ggc	14019				
Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly					
410										415					420					
gtc	ctg	gct	gct	ttg	gcc	gcg	tat	tgc	ctg	tca	aca	ggc	tgc	gtg	gtc	14067				
Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val					
430										435					440					
ata	gtg	ggc	agg	gtc	gtc	ttg	tcc	ggg	aag	ccg	gca	atc	ata	cct	gac	14115				
Ile	Val	Gly	Arg	Val	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp					
445										450					455					
agg	gaa	gtc	ctc	tac	cga	gag	ttc	gat	gag	atg	gaa	gag	tgc	tct	cag	14163				
Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser	Gln					
460										465					470					
cac	tta	ccg	tac	atc	gag	caa	ggg	atg	atg	ctc	gcc	gag	cag	ttc	aag	14211				
His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	Met	Met	Leu	Ala	Glu	Gln	Phe	Lys					
475										480					485					
cag	aag	gcc	ctc	ggc	ctc	ctg	cag	acc	gcg	tcc	cgt	cag	gca	gag	gtt	14259				
Gln	Lys	Ala	Leu	Gly	Leu	Leu	Gln	Thr	Ala	Ser	Arg	Gln	Ala	Glu	Val					
490										495					500					
															505					

atc gcc cct gct gtc cag acc aac tgg caa aaa ctc gag acc ttc tgg	14307
Ile Ala Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Thr Phe Trp	
510 515 520	
gcg aag cat atg tgg aac ttc atc agt ggg ata caa tac ttg gcg ggc	14355
Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly	
525 530 535	
ttg tca acg ctg cct ggt aac ccc gcc att gct tca ttg atg gct ttt	14403
Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe	
540 545 550	
aca gct gct gtc acc agc cca cta acc act agc caa acc ctc ctc ttc	14451
Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu Phe	
555 560 565	
aac ata ttg ggg ggg tgg gtg gct gcc cag ctc gcc gcc ccc ggt gcc	14499
Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala	
570 575 580 585	
gct act gcc ttt gtg ggc gct ggc tta gct ggc gcc gcc atc ggc agt	14547
Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly Ser	
590 595 600	
gtt gga ctg ggg aag gtc ctc ata gac atc ctt gca ggg tat ggc gcg	14595
Val Gly Leu Gly Lys Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly Ala	
605 610 615	
ggc gtg gcg gga gct ctt gtg gca ttc aag atc atg agc ggt gag gtc	14643
Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val	
620 625 630	
ccc tcc acg gag gac ctg gtc aat cta ctg ccc gcc atc ctc tcg ccc	14691
Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro	
635 640 645	
gga gcc ctc gta gtc ggc gtg gtc tgt gca gca ata ctg cgc cgg cac	14739
Gly Ala Leu Val Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg His	
650 655 660 665	
gtt ggc ccg ggc gag ggg gca gtg cag tgg atg aac cgg ctg ata gcc	14787
Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala	
670 675 680	
ttc gcc tcc cgg ggg aac cat gtt tcc ccc acg cac tac gtg ccg gag	14835
Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu	
685 690 695	
agc gat gca gct gcc cgc gtc act gcc ata ctc agc agc ctc act gta	14883
Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val	
700 705 710	
acc cag ctc ctg agg cga ctg cac cag tgg ata agc tcg gag tgt acc	14931
Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr	
715 720 725	
act cca tgc tcc ggt tcc tgg cta agg gac atc tgg gac tgg ata tgc	14979

Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	
730					735					740					745	
gag	gtg	ttg	agc	gac	ttt	aag	acc	tgg	cta	aaa	gct	aag	ctc	atg	cca	15027
Glu	Val	Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	
				750					755					760		
cag	ctg	cct	ggg	atc	ccc	ttt	gtg	tcc	tgc	cag	cgc	ggg	tat	aag	ggg	15075
Gln	Leu	Pro	Gly	Ile	Pro	Phe	Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	
			765					770					775			
gtc	tgg	cga	ggg	gac	ggc	atc	atg	cac	act	cgc	tgc	cac	tgt	gga	gct	15123
Val	Trp	Arg	Gly	Asp	Gly	Ile	Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	
			780				785						790			
gag	atc	act	gga	cat	gtc	aaa	aac	ggg	acg	atg	agg	atc	gtc	ggg	cct	15171
Glu	Ile	Thr	Gly	His	Val	Lys	Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	
	795					800					805					
agg	acc	tgc	agg	aac	atg	tgg	agt	ggg	acc	ttc	ccc	att	aat	gcc	tac	15219
Arg	Thr	Cys	Arg	Asn	Met	Trp	Ser	Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	
810					815					820					825	
acc	acg	ggc	ccc	tgt	acc	ccc	ctt	cct	gcg	ccg	aac	tac	acg	ttc	gcg	15267
Thr	Thr	Gly	Pro	Cys	Thr	Pro	Leu	Pro	Ala	Pro	Asn	Tyr	Thr	Phe	Ala	
				830					835					840		
cta	tgg	agg	gtg	tct	gca	gag	gaa	tac	gtg	gag	ata	agg	cag	gtg	ggg	15315
Leu	Trp	Arg	Val	Ser	Ala	Glu	Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	
			845					850					855			
gac	ttc	cac	tac	gtg	acg	ggg	atg	act	act	gac	aat	ctt	aaa	tgc	ccg	15363
Asp	Phe	His	Tyr	Val	Thr	Gly	Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	
		860					865					870				
tgc	cag	gtc	cca	tcg	ccc	gaa	ttt	ttc	aca	gaa	ttg	gac	ggg	gtg	cgc	15411
Cys	Gln	Val	Pro	Ser	Pro	Glu	Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	
	875					880					885					
cta	cat	agg	ttt	gcg	ccc	ccc	tgc	aag	ccc	ttg	ctg	cgg	gag	gag	gta	15459
Leu	His	Arg	Phe	Ala	Pro	Pro	Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	
890					895					900					905	
tca	ttc	aga	gta	gga	ctc	cac	gaa	tac	ccg	gta	ggg	tcg	caa	tta	cct	15507
Ser	Phe	Arg	Val	Gly	Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	
				910					915					920		
tgc	gag	ccc	gaa	ccg	gac	gtg	gcc	gtg	ttg	acg	tcc	atg	ctc	act	gat	15555
Cys	Glu	Pro	Glu	Pro	Asp	Val	Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	
			925					930					935			
ccc	tcc	cat	ata	aca	gca	gag	gcg	gcc	ggg	cga	agg	ttg	gcg	agg	gga	15603
Pro	Ser	His	Ile	Thr	Ala	Glu	Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	
		940					945					950				
tca	ccc	ccc	tct	gtg	gcc	agc	tcc	tcg	gct	agc	cag	cta	tcc	gct	cca	15651
Ser	Pro	Pro	Ser	Val	Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	

955	960	965	
tct ctc aag gca act tgc acc gct aac cat gac tcc cct gat gct gag			15699
Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu			
970	975	980	985
ctc ata gag gcc aac ctc cta tgg agg cag gag atg ggc ggc aac atc			15747
Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile			
	990	995	1000
acc agg gtt gag tca gaa aac aaa gtg gtg att ctg gac tcc ttc gat			15795
Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp			
	1005	1010	1015
ccg ctt gtg gcg gag gag gac gag cgg gag atc tcc gta ccc gca gaa			15843
Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala Glu			
	1020	1025	1030
atc ctg cgg aag tct cgg aga ttc gcc cag gcc ctg ccc gtt tgg gcg			15891
Ile Leu Arg Lys Ser Arg Arg Phe Ala Gln Ala Leu Pro Val Trp Ala			
	1035	1040	1045
cgg ccg gac tat aac ccc ccg cta gtg gag acg tgg aaa aag ccc gac			15939
Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp			
1050	1055	1060	1065
tac gaa cca cct gtg gtc cat ggc tgc ccg ctt cca cct cca aag tcc			15987
Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser			
	1070	1075	1080
cct cct gtg cct ccg cct cgg aag aag cgg acg gtg gtc ctc act gaa			16035
Pro Pro Val Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu			
	1085	1090	1095
tca acc cta tct act gcc ttg gcc gag ctc gcc acc aga agc ttt ggc			16083
Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe Gly			
	1100	1105	1110
agc tcc tca act tcc ggc att acg ggc gac aat acg aca aca tcc tct			16131
Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser			
	1115	1120	1125
gag ccc gcc cct tct ggc tgc ccc ccc gac tcc gac gct gag tcc tat			16179
Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr			
1130	1135	1140	1145
tcc tcc atg ccc ccc ctg gag ggg gag cct ggg gat ccg gat ctt agc			16227
Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser			
	1150	1155	1160
gac ggg tca tgg tca acg gtc agt agt gag gcc aac gcg gag gat gtc			16275
Asp Gly Ser Trp Ser Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val			
	1165	1170	1175
gtg tgc tgc tca atg tct tac tct tgg aca ggc gca ctc gtc acc ccg			16323
Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro			
	1180	1185	1190

tgc gcc gcg gaa gaa cag aaa ctg ccc atc aat gca cta agc aac tcg Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser 1195 1200 1205	16371
ttg cta cgt cac cac aat ttg gtg tat tcc acc acc tca cgc agt gct Leu Leu Arg His His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala 1210 1215 1220 1225	16419
tgc caa agg cag aag aaa gtc aca ttt gac aga ctg caa gtt ctg gac Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp 1230 1235 1240	16467
agc cat tac cag gac gta ctc aag gag gtt aaa gca gcg gcg tca aaa Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys 1245 1250 1255	16515
gtg aag gct aac ttg cta tcc gta gag gaa gct tgc agc ctg acg ccc Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro 1260 1265 1270	16563
cca cac tca gcc aaa tcc aag ttt ggt tat ggg gca aaa gac gtc cgt Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg 1275 1280 1285	16611
tgc cat gcc aga aag gcc gta acc cac atc aac tcc gtg tgg aaa gac Cys His Ala Arg Lys Ala Val Thr His Ile Asn Ser Val Trp Lys Asp 1290 1295 1300 1305	16659
ctt ctg gaa gac aat gta aca cca ata gac act acc atc atg gct aag Leu Leu Glu Asp Asn Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys 1310 1315 1320	16707
aac gag gtt ttc tgc gtt cag cct gag aag ggg ggt cgt aag cca gct Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly Gly Arg Lys Pro Ala 1325 1330 1335	16755
cgt ctc atc gtg ttc ccc gat ctg ggc gtg cgc gtg tgc gaa aag atg Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys Met 1340 1345 1350	16803
gct ttg tac gac gtg gtt aca aag ctc ccc ttg gcc gtg atg gga agc Ala Leu Tyr Asp Val Val Thr Lys Leu Pro Leu Ala Val Met Gly Ser 1355 1360 1365	16851
tcc tac gga ttc caa tac tca cca gga cag cgg gtt gaa ttc ctc gtg Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu Val 1370 1375 1380 1385	16899
caa gcg tgg aag tcc aag aaa acc cca atg ggg ttc tcg tat gat acc Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly Phe Ser Tyr Asp Thr 1390 1395 1400	16947
cgc tgc ttt gac tcc aca gtc act gag agc gac atc cgt acg gag gag Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu 1405 1410 1415	16995
gca atc tac caa tgt tgt gac ctc gac ccc caa gcc cgc gtg gcc atc	17043

Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile	
1420 1425 1430	
aag tcc ctc acc gag agg ctt tat gtt ggg ggc cct ctt acc aat tca	17091
Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser	
1435 1440 1445	
agg ggg gag aac tgc ggc tat cgc agg tgc cgc gcg agc ggc gta ctg	17139
Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu	
1450 1455 1460 1465	
aca act agc tgt ggt aac acc ctc act tgc tac atc aag gcc cgg gca	17187
Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala	
1470 1475 1480	
gcc tgt cga gcc gca ggg ctc cag gac tgc acc atg ctc gtg tgt ggc	17235
Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly	
1485 1490 1495	
gac gac tta gtc gtt atc tgt gaa agc gcg ggg gtc cag gag gac gcg	17283
Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala	
1500 1505 1510	
gcg agc ctg aga gcc ttc acg gag gct atg acc agg tac tcc gcc ccc	17331
Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro	
1515 1520 1525	
cct ggg gac ccc cca caa cca gaa tac gac ttg gag ctc ata aca tca	17379
Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser	
1530 1535 1540 1545	
tgc tcc tcc aac gtg tca gtc gcc cac gac ggc gct gga aag agg gtc	17427
Cys Ser Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val	
1550 1555 1560	
tac tac ctc acc cgt gac cct aca acc ccc ctc gcg aga gct gcg tgg	17475
Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp	
1565 1570 1575	
gag aca gca aga cac act cca gtc aat tcc tgg cta ggc aac ata atc	17523
Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile	
1580 1585 1590	
atg ttt gcc ccc aca ctg tgg gcg agg atg ata ctg atg acc cat ttc	17571
Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His Phe	
1595 1600 1605	
ttt agc gtc ctt ata gcc agg gac cag ctt gaa cag gcc ctc gat tgc	17619
Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys	
1610 1615 1620 1625	
gag atc tac ggg gcc tgc tac tcc ata gaa cca ctg gat cta cct cca	17667
Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro	
1630 1635 1640	
atc att caa aga ctc cat ggc ctc agc gca ttt tca ctc cac agt tac	17715
Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr	

1645	1650	1655	
tct cca ggt gaa atc aat agg gtg gcc gca tgc ctc aga aaa ctt ggg			17763
Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly			
1660	1665	1670	
gta ccg ccc ttg cga gct tgg aga cac cgg gcc cgg agc gtc cgc gct			17811
Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala			
1675	1680	1685	
agg ctt ctg gcc aga gga ggc agg gct gcc ata tgt ggc aag tac ctc			17859
Arg Leu Leu Ala Arg Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu			
1690	1695	1700	1705
ttc aac tgg gca gta aga aca aag ctc aaa ctc act cca ata gcg gcc			17907
Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala			
1710	1715	1720	
gct ggc cag ctg gac ttg tcc ggc tgg ttc acg gct ggc tac agc ggg			17955
Ala Gly Gln Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly			
1725	1730	1735	
gga gac att tat cac agc gtg tct cat gcc cgg ccc cgc tgg atc tgg			18003
Gly Asp Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp			
1740	1745	1750	
ttt tgc cta ctc ctg ctt gct gca ggg gta ggc atc tac ctc ctc ccc			18051
Phe Cys Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro			
1755	1760	1765	
aac cga tgaaggttgg ggtaaact cccgcctaaa aaaaaaaaaa aatctagaac			18107
Asn Arg			
1770			
ccgagtcgac tttgttccca ctgtactttt agctcgtaca aaatacaata tacttttcat			18167
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ggtgtggtcg ccatgatcgc gtagtcgata gtggctccaa gtagcgaagc gagcaggact			18467
gggcggcggc caaagcggtc ggacagtgt ccgagaacgg gtgcgcatag aaattgcatc			18527
aacgcatata gcgctagcag cagccatag tgactggcga tgctgtcgga atggacgata			18587
tcccgaaga ggcccggcag taccggcata accaagccta tgcctacagc atccaggggtg			18647
acggtgccga ggatgacgat gagcgcattg ttagatttca tacacggtgc ctgactgcgt			18707
tagcaattta actgtgataa actaccgcat taaagctttt tctttccaat tttttttttt			18767
tcgtcattat aaaaatcatt acgaccgaga ttcccgggta ataactgata taattaaatt			18827



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<210> 9

<211> 1771

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pd.deltaNS3NS5

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Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His
			20					25					30		
Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly
		35					40						45		

Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
 50 55 60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
 65 70 75 80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
 85 90 95  
 Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
 100 105 110  
 Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
 115 120 125  
 Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
 130 135 140  
 Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
 145 150 155 160  
 Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
 165 170 175  
 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
 180 185 190  
 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
 195 200 205  
 Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe  
 210 215 220  
 Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp  
 225 230 235 240  
 Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro  
 245 250 255  
 Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe  
 260 265 270  
 Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr  
 275 280 285  
 Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn  
 290 295 300  
 Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly  
 305 310 315 320  
 Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr  
 325 330 335  
 Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val Ala Tyr Gln Ala Thr  
 340 345 350

Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp  
355 360 365  
Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu  
370 375 380  
Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Ile Thr Leu Thr His Pro  
385 390 395 400  
Val Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val  
405 410 415  
Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala  
420 425 430  
Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Val Val Leu  
435 440 445  
Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu  
450 455 460  
Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln  
465 470 475 480  
Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu  
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Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala Pro Ala Val Gln Thr  
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Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys His Met Trp Asn Phe  
515 520 525  
Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn  
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Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro  
545 550 555 560  
Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val  
565 570 575  
Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala  
580 585 590  
Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu  
595 600 605  
Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val  
610 615 620  
Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val  
625 630 635 640  
Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val  
645 650 655

Val	Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	
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Val	Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	
		675					680					685				
Val	Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	
	690					695				700						
Thr	Ala	Ile	Leu	Ser	Ser	Leu	Thr	Val	Thr	Gln	Leu	Leu	Arg	Arg	Leu	
705					710					715					720	
His	Gln	Trp	Ile	Ser	Ser	Glu	Cys	Thr	Thr	Pro	Cys	Ser	Gly	Ser	Trp	
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Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	Glu	Val	Leu	Ser	Asp	Phe	Lys	
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Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu	Pro	Gly	Ile	Pro	Phe	
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Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	
	770					775					780					
Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile	Thr	Gly	His	Val	Lys	
785					790					795					800	
Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Arg	Asn	Met	Trp	
			805						810					815		
Ser	Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	
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Leu	Pro	Ala	Pro	Asn	Tyr	Thr	Phe	Ala	Leu	Trp	Arg	Val	Ser	Ala	Glu	
		835					840					845				
Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	
	850					855					860					
Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ser	Pro	Glu	
865					870					875					880	
Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His	Arg	Phe	Ala	Pro	Pro	
			885						890					895		
Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe	Arg	Val	Gly	Leu	His	
		900						905					910			
Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	
	915						920					925				
Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	
	930					935					940					
Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Val	Ala	Ser	
945					950					955					960	

Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr  
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 Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu  
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 Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn  
                   995                       1000                       1005  
 Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp  
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 Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg  
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 Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro  
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 Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His  
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 Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg  
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 Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu  
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 Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile  
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 Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys  
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 Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu  
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 Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val  
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 Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met Ser Tyr  
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 Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys  
 1185                       1190                       1195                       1200  
 Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu  
                   1205                       1210                       1215  
 Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val  
                   1220                       1225                       1230  
 Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu  
                   1235                       1240                       1245  
 Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser  
                   1250                       1255                       1260

Val	Glu	Glu	Ala	Cys	Ser	Leu	Thr	Pro	Pro	His	Ser	Ala	Lys	Ser	Lys	1265	1270	1275	1280
Phe	Gly	Tyr	Gly	Ala	Lys	Asp	Val	Arg	Cys	His	Ala	Arg	Lys	Ala	Val	1285	1290	1295	
Thr	His	Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu	Glu	Asp	Asn	Val	Thr	1300	1305	1310	
Pro	Ile	Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu	Val	Phe	Cys	Val	Gln	1315	1320	1325	
Pro	Glu	Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro	Asp	1330	1335	1340	
Leu	Gly	Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val	Val	Thr	1345	1350	1355	1360
Lys	Leu	Pro	Leu	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	1365	1370	1375	
Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala	Trp	Lys	Ser	Lys	Lys	1380	1385	1390	
Thr	Pro	Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	1395	1400	1405	
Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala	Ile	Tyr	Gln	Cys	Cys	Asp	1410	1415	1420	
Leu	Asp	Pro	Gln	Ala	Arg	Val	Ala	Ile	Lys	Ser	Leu	Thr	Glu	Arg	Leu	1425	1430	1435	1440
Tyr	Val	Gly	Gly	Pro	Leu	Thr	Asn	Ser	Arg	Gly	Glu	Asn	Cys	Gly	Tyr	1445	1450	1455	
Arg	Arg	Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	1460	1465	1470	
Leu	Thr	Cys	Tyr	Ile	Lys	Ala	Arg	Ala	Ala	Cys	Arg	Ala	Ala	Gly	Leu	1475	1480	1485	
Gln	Asp	Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Cys	1490	1495	1500	
Glu	Ser	Ala	Gly	Val	Gln	Glu	Asp	Ala	Ala	Ser	Leu	Arg	Ala	Phe	Thr	1505	1510	1515	1520
Glu	Ala	Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Gln	Pro	1525	1530	1535	
Glu	Tyr	Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	1540	1545	1550	
Ala	His	Asp	Gly	Ala	Gly	Lys	Arg	Val	Tyr	Tyr	Leu	Thr	Arg	Asp	Pro	1555	1560	1565	

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 1570 1575 1580  
 Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp  
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 Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly  
 1635 1640 1645  
 Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg  
 1650 1655 1660  
 Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp  
 1665 1670 1675 1680  
 Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg Gly Gly  
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 Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr  
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 Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp Leu Ser  
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 Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val  
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 Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu Leu Ala  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence:  
 pd.deltaNS3NS5.pj

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Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Ile		
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acc	ctg	acg	cac	cca	gtc	acc	aaa	tac	atc	atg	aca	tgc	atg	tcg	gcc	13911	
Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	Ser	Ala		



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gac	ctg	gag	gtc	gtc	acg	agc	acc	tgg	gtg	ctc	gtt	ggc	ggc	gtc	ctg	13959				
Asp	Leu	Glu	Val	Val	Thr	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu					
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gct	gct	ttg	gcc	gcg	tat	tgc	ctg	tca	aca	ggc	tgc	gtg	gtc	ata	gtg	14007				
Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val	Ile	Val					
430					435					440										
ggc	agg	gtc	gtc	ttg	tcc	ggg	aag	ccg	gca	atc	ata	cct	gac	agg	gaa	14055				
Gly	Arg	Val	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu					
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gtc	ctc	tac	cga	gag	ttc	gat	gag	atg	gaa	gag	tgc	tct	cag	cac	tta	14103				
Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser	Gln	His	Leu					
460					465					470					475					
ccg	tac	atc	gag	caa	ggg	atg	atg	ctc	gcc	gag	cag	ttc	aag	cag	aag	14151				
Pro	Tyr	Ile	Glu	Gln	Gly	Met	Met	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys					
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gcc	ctc	ggc	ctc	ctg	cag	acc	gcg	tcc	cgt	cag	gca	gag	gtt	atc	gcc	14199				
Ala	Leu	Gly	Leu	Leu	Gln	Thr	Ala	Ser	Arg	Gln	Ala	Glu	Val	Ile	Ala					
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cct	gct	gtc	cag	acc	aac	tgg	caa	aaa	ctc	gag	acc	ttc	tgg	gcg	aag	14247				
Pro	Ala	Val	Gln	Thr	Asn	Trp	Gln	Lys	Leu	Glu	Thr	Phe	Trp	Ala	Lys					
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cat	atg	tgg	aac	ttc	atc	agt	ggg	ata	caa	tac	ttg	gcg	ggc	ttg	tca	14295				
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Thr	Leu	Pro	Gly	Asn	Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala					
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Ala	Val	Thr	Ser	Pro	Leu	Thr	Thr	Ser	Gln	Thr	Leu	Leu	Phe	Asn	Ile					
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ctg	ggg	aag	gtc	ctc	ata	gac	atc	ctt	gca	ggg	tat	ggc	gcg	ggc	gtg	14535				
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Ala	Gly	Ala	Leu	Val	Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu	Val	Pro	Ser					
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Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala	
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Leu Val Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg His Val Gly	
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Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala	
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Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp	
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Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln	
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Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro	
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Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val	
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Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp	
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Arg Gly Asp Gly Ile Met His Thr Arg Cys His Cys Gly Ala Glu Ile	
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Thr Gly His Val Lys Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr	
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Cys Arg Asn Met Trp Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr	
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Gly Pro Cys Thr Pro Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp	
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Arg	Val	Gly	Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	
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Pro	Glu	Pro	Asp	Val	Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	
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His	Ile	Thr	Ala	Glu	Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	
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ccc	tct	gtg	gcc	agc	tcc	tcg	gct	agc	cag	cta	tcc	gct	cca	tct	ctc	15591
Pro	Ser	Val	Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	
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Lys	Ala	Thr	Cys	Thr	Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile	
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Val	Glu	Ser	Glu	Asn	Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Asp	Pro	Leu	
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Asp	Tyr	Asn	Pro	Pro	Leu	Val	Glu	Thr	Trp	Lys	Lys	Pro	Asp	Tyr	Glu	
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Pro	Pro	Val	Val	His	Gly	Cys	Pro	Leu	Pro	Pro	Pro	Lys	Ser	Pro	Pro	
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Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro			
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gcc cct tct ggc tgc ccc ccc gac tcc gac gct gag tcc tat tcc tcc			16119
Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser			
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Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly			
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Ser Trp Ser Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys			
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Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala			
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Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu			
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Arg His His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln			
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agg cag aag aaa gtc aca ttt gac aga ctg caa gtt ctg gac agc cat			16407
Arg Gln Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His			
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tac cag gac gta ctc aag gag gtt aaa gca gcg gcg tca aaa gtg aag			16455
Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys			
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gct aac ttg cta tcc gta gag gaa gct tgc agc ctg acg ccc cca cac			16503
Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His			
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tca gcc aaa tcc aag ttt ggt tat ggg gca aaa gac gtc cgt tgc cat			16551
Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His			
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gcc aga aag gcc gta acc cac atc aac tcc gtg tgg aaa gac ctt ctg			16599
Ala Arg Lys Ala Val Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu			
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gaa gac aat gta aca cca ata gac act acc atc atg gct aag aac gag			16647
Glu Asp Asn Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu			
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                     35                    40                    45  
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 cta gta ctc aac ccc tct gtt gct gca aca ctg ggc ttt ggt gct tac 12759  
 Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr  
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 Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg  
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 Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe  
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 Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys  
 60 65 70 75  
 gac gag tgc cac tcc acg gat gcc aca tcc atc ttg ggc att ggc act 12951

Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile	Gly	Thr		
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gtc	ctt	gac	caa	gca	gag	act	gcg	ggg	gcg	aga	ctg	ggt	gtg	ctc	gcc	12999	
Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala		
			95					100					105				
acc	gcc	acc	cct	ccg	ggc	tcc	gtc	act	gtg	ccc	cat	ccc	aac	atc	gag	13047	
Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu		
			110					115				120					
gag	gtt	gct	ctg	tcc	acc	acc	gga	gag	atc	cct	ttt	tac	ggc	aag	gct	13095	
Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala		
	125						130				135						
atc	ccc	ctc	gaa	gta	atc	aag	ggg	ggg	aga	cat	ctc	atc	ttc	tgt	cat	13143	
Ile	Pro	Leu	Glu	Val	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His		
	140					145				150					155		
tca	aag	aag	aag	tgc	gac	gaa	ctc	gcc	gca	aag	ctg	gtc	gca	ttg	ggc	13191	
Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala	Leu	Gly		
				160					165					170			
atc	aat	gcc	gtg	gcc	tac	tac	cgc	ggt	ctt	gac	gtg	tcc	gtc	atc	ccg	13239	
Ile	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro		
			175					180					185				
acc	agc	ggc	gat	gtt	gtc	gtc	gtg	gca	acc	gat	gcc	ctc	atg	acc	ggc	13287	
Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly		
			190					195				200					
tat	acc	ggc	gac	ttc	gac	tcg	gtg	ata	gac	tgc	aat	acg	tgt	gtc	acc	13335	
Tyr	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr		
	205						210				215						
cag	aca	gtc	gat	ttc	agc	ctt	gac	cct	acc	ttc	acc	att	gag	aca	atc	13383	
Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Ile		
	220					225				230					235		
acg	ctc	ccc	caa	gat	gct	gtc	tcc	cgc	act	caa	cgt	cgg	ggc	agg	act	13431	
Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	Arg	Thr		
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ggc	agg	ggg	aag	cca	ggc	atc	tac	aga	ttt	gtg	gca	ccg	ggg	gag	cgc	13479	
Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	Glu	Arg		
			255					260					265				
ccc	tcc	ggc	atg	ttc	gac	tcg	tcc	gtc	ctc	tgt	gag	tgc	tat	gac	gca	13527	
Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala		
			270					275				280					
ggc	tgt	gct	tgg	tat	gag	ctc	acg	ccc	gcc	gag	act	aca	gtt	agg	cta	13575	
Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu		
	285					290					295						
cga	gcg	tac	atg	aac	acc	ccg	ggg	ctt	ccc	gtg	tgc	cag	gac	cat	ctt	13623	
Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu		

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Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His				
320 325 330				
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Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val				
335 340 345				
gcg tac caa gcc acc gtg tgc gct agg gct caa gcc cct ccc cca tcg	13767			
Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser				
350 355 360				
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Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His				
365 370 375				
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Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Ile				
380 385 390 395				
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Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met Ser Ala				
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Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu				
415 420 425				
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Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val				
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Gly Arg Val Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu				
445 450 455				
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Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu				
460 465 470 475				
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Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys				
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Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala				
495 500 505				
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Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys				
510 515 520				
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His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser				
525 530 535				

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Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala	
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Ala Val Thr Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile	
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Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr	
575 580 585	
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Leu Gly Lys Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val	
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Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser	
620 625 630 635	
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Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala	
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655 660 665	
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Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala	
670 675 680	
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Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp	
685 690 695	
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Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln	
700 705 710 715	
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Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro	
720 725 730	
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Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val	
735 740 745	
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Leu Ser Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu	
750 755 760	
cct ggg atc ccc ttt gtg tcc tgc cag cgc ggg tat aag ggg gtc tgg	15015



Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp	
765 770 775	
cga ggg gac ggc atc atg cac act cgc tgc cac tgt gga gct gag atc	15063
Arg Gly Asp Gly Ile Met His Thr Arg Cys His Cys Gly Ala Glu Ile	
780 785 790 795	
act gga cat gtc aaa aac ggg acg atg agg atc gtc ggt cct agg acc	15111
Thr Gly His Val Lys Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr	
800 805 810	
tgc agg aac atg tgg agt ggg acc ttc ccc att aat gcc tac acc acg	15159
Cys Arg Asn Met Trp Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr	
815 820 825	
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Gly Pro Cys Thr Pro Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp	
830 835 840	
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His Tyr Val Thr Gly Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln	
860 865 870 875	
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Val Pro Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His	
880 885 890	
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Arg Phe Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe	
895 900 905	
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Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu	
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Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser	
925 930 935	
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His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro	
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Pro Ser Val Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu	
960 965 970	
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Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile	
975 980 985	
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Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg	

990	995	1000	
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Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu			
1005	1010	1015	
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Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu			
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Arg Lys Ser Arg Arg Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro			
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Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu			
	1055	1060	1065
cca cct gtg gtc cat ggc tgc ccg ctt cca cct cca aag tcc cct cct			15927
Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro			
	1070	1075	1080
gtg cct ccg cct cgg aag aag cgg acg gtg gtc ctc act gaa tca acc			15975
Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr			
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cta tct act gcc ttg gcc gag ctc gcc acc aga agc ttt ggc agc tcc			16023
Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser			
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tca act tcc ggc att acg ggc gac aat acg aca aca tcc tct gag ccc			16071
Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro			
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gcc cct tct ggc tgc ccc ccc gac tcc gac gct gag tcc tat tcc tcc			16119
Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser			
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atg ccc ccc ctg gag ggg gag cct ggg gat ccg gat ctt agc gac ggg			16167
Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly			
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Ser Trp Ser Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys			
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Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala			
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gcg gaa gaa cag aaa ctg ccc atc aat gca cta agc aac tcg ttg cta			16311
Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu			
	1200	1205	1210
cgt cac cac aat ttg gtg tat tcc acc acc tca cgc agt gct tgc caa			16359
Arg His His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln			
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Arg Gln Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His	
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Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys	
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Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His	
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Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His	
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gcc aga aag gcc gta acc cac atc aac tcc gtg tgg aaa gac ctt ctg	16599
Ala Arg Lys Ala Val Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu	
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gaa gac aat gta aca cca ata gac act acc atc atg gct aag aac gag	16647
Glu Asp Asn Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu	
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Val Phe Cys Val Gln Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu	
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Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu	
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Tyr Asp Val Val Thr Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr	
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Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala	
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Trp Lys Ser Lys Lys Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys	
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Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile	
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Tyr Gln Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser	
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Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly	
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Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr	
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Ser Cys Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys	
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cga gcc gca ggg ctc cag gac tgc acc atg ctc gtg tgt ggc gac gac	17175
Arg Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp	
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tta gtc gtt atc tgt gaa agc gcg ggg gtc cag gag gac gcg gcg agc	17223
Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser	
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ctg aga gcc ttc acg gag gct atg acc agg tac tcc gcc ccc cct ggg	17271
Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly	
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Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser	
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Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr	
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Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr	
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Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe	
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gcc ccc aca ctg tgg gcg agg atg ata ctg atg acc cat ttc ttt agc	17511
Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser	
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Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile	
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Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile	
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caa aga ctc cat ggc ctc agc gca ttt tca ctc cac agt tac tct cca	17655
Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro	
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Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro	
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Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu	

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Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly			
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Gln Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp			
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att tat cac agc gtg tct cat gcc cgg ccc cgc tgg atc tgg ttt tgc			17943
Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys			
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Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg			
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Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn			
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Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly			
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Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala			
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Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro			
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Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly			
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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp			
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<220>  
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 35 40 45  
 Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
 50 55 60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
 65 70 75 80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
 85 90 95  
 Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
 100 105 110  
 Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
 115 120 125  
 Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
 130 135 140  
 Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
 145 150 155 160  
 Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
 165 170 175  
 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
 180 185 190  
 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
 195 200 205  
 Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe  
 210 215 220  
 Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp  
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 Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro  
 245 250 255

Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	
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Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	
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Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu	Arg	Ala	Tyr	Met	Asn	
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Asn	Trp	Gln	Lys	Leu	Glu	Thr	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	
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Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ala	Val	Thr	Ser	Pro	
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 580 585 590  
 Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu  
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 Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val  
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 Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val  
 645 650 655  
 Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala  
 660 665 670  
 Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His  
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ctgatctcct ctgccggaac accgggcacg tccaacttat aagttggaga aataagagaa 12240  
tttcagattg agagaatgaa aaaaaaaaaac ccttagttca taggtccatt ctcttagcgc 12300  
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caacctgcct ggagtaaag atgacacaag gcaattgacc cacgcatgta tctatctcat 12420  
tttcttacac cttctattac cttctgctct ctctgatttg gaaaaagctg aaaaaaagg 12480  
ttgaaaccag ttccctgaaa ttattccct acttgactaa taagtatata aagacggtag 12540  
gtattgattg taattctgta aatctatttc ttaaacttct taaattctac ttttatagtt 12600  
agtctttttt ttagttttta aacaccaaga acttagtttc gaataaacac acataaacia 12660  
acaagcttac aaacaaa atg gct gca tat gca gct cag ggc tat aag gtg 12711

	Met	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	
	1				5					10		
cta gta ctc aac ccc tct gtt gct gca aca ctg ggc ttt ggt gct tac	12759											
Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr												
	15 20 25											
atg tcc aag gct cat ggg atc gat cct aac atc agg acc ggg gtg aga	12807											
Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg												
	30 35 40											
aca att acc act ggc agc ccc atc acg tac tcc acc tac ggc aag ttc	12855											
Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe												
	45 50 55											
ctt gcc gac ggc ggg tgc tgc ggg ggc gct tat gac ata ata att tgt	12903											
Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys												
	60 65 70 75											
gac gag tgc cac tcc acg gat gcc aca tcc atc ttg ggc att ggc act	12951											
Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr												
	80 85 90											
gtc ctt gac caa gca gag act gcg ggg gcg aga ctg gtt gtg ctc gcc	12999											
Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala												
	95 100 105											
acc gcc acc cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc gag	13047											
Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile Glu												
	110 115 120											
gag gtt gct ctg tcc acc acc gga gag atc cct ttt tac ggc aag gct	13095											
Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala												
	125 130 135											
atc ccc ctc gaa gta atc aag ggg ggg aga cat ctc atc ttc tgt cat	13143											
Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His												
	140 145 150 155											
tca aag aag aag tgc gac gaa ctc gcc gca aag ctg gtc gca ttg ggc	13191											
Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly												
	160 165 170											
atc aat gcc gtg gcc tac tac cgc ggt ctt gac gtg tcc gtc atc ccg	13239											
Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro												
	175 180 185											
acc agc ggc gat gtt gtc gtc gtg gca acc gat gcc ctc atg acc ggc	13287											
Thr Ser Gly Asp Val Val Val Val Ala Thr Asp Ala Leu Met Thr Gly												
	190 195 200											
tat acc ggc gac ttc gac tgc gtg ata gac tgc aat acg tgt gtc acc	13335											
Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr												
	205 210 215											
cag aca gtc gat ttc agc ctt gac cct acc ttc acc att gag aca atc	13383											
Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile												

220	225	230	235	
acg ctc ccc caa gat gct gtc tcc cgc act caa cgt cgg ggc agg act	13431			
Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr				
240 245 250				
ggc agg ggg aag cca ggc atc tac aga ttt gtg gca ccg ggg gag cgc	13479			
Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg				
255 260 265				
ccc tcc ggc atg ttc gac tcg tcc gtc ctc tgt gag tgc tat gac gca	13527			
Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala				
270 275 280				
ggc tgt gct tgg tat gag ctc acg ccc gcc gag act aca gtt agg cta	13575			
Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu				
285 290 295				
cga gcg tac atg aac acc ccg ggg ctt ccc gtg tgc cag gac cat ctt	13623			
Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu				
300 305 310 315				
gaa ttt tgg gag ggc gtc ttt aca ggc ctc act cat ata gat gcc cac	13671			
Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His				
320 325 330				
ttt cta tcc cag aca aag cag agt ggg gag aac ctt cct tac ctg gta	13719			
Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val				
335 340 345				
gcg tac caa gcc acc gtg tgc gct agg gct caa gcc cct ccc cca tcg	13767			
Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser				
350 355 360				
tgg gac cag atg tgg aag tgt ttg att cgc ctc aag ccc acc ctc cat	13815			
Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His				
365 370 375				
ggg cca aca ccc ctg cta tac aga ctg ggc gct gtt cag aat gaa atc	13863			
Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Ile				
380 385 390 395				
acc ctg acg cac cca gtc acc aaa tac atc atg aca tgc atg tcg gcc	13911			
Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met Ser Ala				
400 405 410				
gac ctg gag gtc gtc acg agc acc tgg gtg ctc gtt ggc ggc gtc ctg	13959			
Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu				
415 420 425				
gct gct ttg gcc gcg tat tgc ctg tca aca ggc tgc gtg gtc ata gtg	14007			
Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val				
430 435 440				
ggc agg gtc gtc ttg tcc ggg aag ccg gca atc ata cct gac agg gaa	14055			
Gly Arg Val Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu				
445 450 455				

gtc ctc tac cga gag ttc gat gag atg gaa gag tgc tct cag cac tta	14103
Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu	
460 465 470 475	
ccg tac atc gag caa ggg atg atg ctc gcc gag cag ttc aag cag aag	14151
Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys	
480 485 490	
gcc ctc ggc ctc ctg cag acc gcg tcc cgt cag gca gag gtt atc gcc	14199
Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala	
495 500 505	
cct gct gtc cag acc aac tgg caa aaa ctc gag acc ttc tgg gcg aag	14247
Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys	
510 515 520	
cat atg tgg aac ttc atc agt ggg ata caa tac ttg gcg ggc ttg tca	14295
His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser	
525 530 535	
acg ctg cct ggt aac ccc gcc att gct tca ttg atg gct ttt aca gct	14343
Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala	
540 545 550 555	
gct gtc acc agc cca cta acc act agc caa acc ctc ctc ttc aac ata	14391
Ala Val Thr Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile	
560 565 570	
ttg ggg ggg tgg gtg gct gcc cag ctc gcc gcc ccc ggt gcc gct act	14439
Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr	
575 580 585	
gcc ttt gtg ggc gct ggc tta gct ggc gcc gcc atc ggc agt gtt gga	14487
Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly	
590 595 600	
ctg ggg aag gtc ctc ata gac atc ctt gca ggg tat ggc gcg ggc gtg	14535
Leu Gly Lys Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val	
605 610 615	
gcg gga gct ctt gtg gca ttc aag atc atg agc ggt gag gtc ccc tcc	14583
Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser	
620 625 630 635	
acg gag gac ctg gtc aat cta ctg ccc gcc atc ctc tcg ccc gga gcc	14631
Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala	
640 645 650	
ctc gta gtc ggc gtg gtc tgt gca gca ata ctg cgc cgg cac gtt ggc	14679
Leu Val Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg His Val Gly	
655 660 665	
ccg ggc gag ggg gca gtg cag tgg atg aac cgg ctg ata gcc ttc gcc	14727
Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala	
670 675 680	
tcc cgg ggg aac cat gtt tcc ccc acg cac tac gtg ccg gag agc gat	14775

Ser	Arg	Gly	Asn	His	Val	Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp		
685						690					695						
gca	gct	gcc	cgc	gtc	act	gcc	ata	ctc	agc	agc	ctc	act	gta	acc	cag	14823	
Ala	Ala	Ala	Arg	Val	Thr	Ala	Ile	Leu	Ser	Ser	Leu	Thr	Val	Thr	Gln		
700					705					710					715		
ctc	ctg	agg	cga	ctg	cac	cag	tgg	ata	agc	tcg	gag	tgt	acc	act	cca	14871	
Leu	Leu	Arg	Arg	Leu	His	Gln	Trp	Ile	Ser	Ser	Glu	Cys	Thr	Thr	Pro		
				720					725					730			
tgc	tcc	ggg	tcc	tgg	cta	agg	gac	atc	tgg	gac	tgg	ata	tgc	gag	gtg	14919	
Cys	Ser	Gly	Ser	Trp	Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	Glu	Val		
			735					740					745				
ttg	agc	gac	ttt	aag	acc	tgg	cta	aaa	gct	aag	ctc	atg	cca	cag	ctg	14967	
Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu		
		750					755					760					
cct	ggg	atc	ccc	ttt	gtg	tcc	tgc	cag	cgc	ggg	tat	aag	ggg	gtc	tgg	15015	
Pro	Gly	Ile	Pro	Phe	Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp		
	765					770					775						
cga	ggg	gac	ggc	atc	atg	cac	act	cgc	tgc	cac	tgt	gga	gct	gag	atc	15063	
Arg	Gly	Asp	Gly	Ile	Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile		
780					785					790					795		
act	gga	cat	gtc	aaa	aac	ggg	acg	atg	agg	atc	gtc	ggg	cct	agg	acc	15111	
Thr	Gly	His	Val	Lys	Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr		
				800					805					810			
tgc	agg	aac	atg	tgg	agt	ggg	acc	ttc	ccc	att	aat	gcc	tac	acc	acg	15159	
Cys	Arg	Asn	Met	Trp	Ser	Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr		
			815					820					825				
ggc	ccc	tgt	acc	ccc	ctt	cct	gcg	ccg	aac	tac	acg	ttc	gcg	cta	tgg	15207	
Gly	Pro	Cys	Thr	Pro	Leu	Pro	Ala	Pro	Asn	Tyr	Thr	Phe	Ala	Leu	Trp		
		830					835						840				
agg	gtg	tct	gca	gag	gaa	tac	gtg	gag	ata	agg	cag	gtg	ggg	gac	ttc	15255	
Arg	Val	Ser	Ala	Glu	Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	Asp	Phe		
	845					850					855						
cac	tac	gtg	acg	ggg	atg	act	act	gac	aat	ctt	aaa	tgc	ccg	tgc	cag	15303	
His	Tyr	Val	Thr	Gly	Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln		
860					865					870					875		
gtc	cca	tcg	ccc	gaa	ttt	ttc	aca	gaa	ttg	gac	ggg	gtg	cgc	cta	cat	15351	
Val	Pro	Ser	Pro	Glu	Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His		
				880					885					890			
agg	ttt	gcg	ccc	ccc	tgc	aag	ccc	ttg	ctg	cgg	gag	gag	gta	tca	ttc	15399	
Arg	Phe	Ala	Pro	Pro	Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe		
			895					900					905				
aga	gta	gga	ctc	cac	gaa	tac	ccg	gta	ggg	tcg	caa	tta	cct	tgc	gag	15447	
Arg	Val	Gly	Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu		



910	915	920	
ccc gaa ccg gac gtg gcc gtg ttg acg tcc atg ctc act gat ccc tcc			15495
Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser			
925	930	935	
cat ata aca gca gag gcg gcc ggg cga agg ttg gcg agg gga tca ccc			15543
His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro			
940	945	950	955
ccc tct gtg gcc agc tcc tcg gct agc cag cta tcc gct cca tct ctc			15591
Pro Ser Val Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu			
	960	965	970
aag gca act tgc acc gct aac cat gac tcc cct gat gct gag ctc ata			15639
Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile			
	975	980	985
gag gcc aac ctc cta tgg agg cag gag atg ggc gcc aac atc acc agg			15687
Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg			
	990	995	1000
gtt gag tca gaa aac aaa gtg gtg att ctg gac tcc ttc gat ccg ctt			15735
Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu			
1005	1010	1015	
gtg gcg gag gag gac gag cgg gag atc tcc gta ccc gca gaa atc ctg			15783
Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu			
1020	1025	1030	1035
cgg aag tct cgg aga ttc gcc cag gcc ctg ccc gtt tgg gcg cgg ccg			15831
Arg Lys Ser Arg Arg Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro			
	1040	1045	1050
gac tat aac ccc ccg cta gtg gag acg tgg aaa aag ccc gac tac gaa			15879
Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu			
	1055	1060	1065
cca cct gtg gtc cat ggc tgc ccg ctt cca cct cca aag tcc cct cct			15927
Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro			
1070	1075	1080	
gtg cct ccg cct cgg aag aag cgg acg gtg gtc ctc act gaa tca acc			15975
Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr			
1085	1090	1095	
cta tct act gcc ttg gcc gag ctc gcc acc aga agc ttt ggc agc tcc			16023
Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser			
1100	1105	1110	1115
tca act tcc ggc att acg ggc gac aat acg aca aca tcc tct gag ccc			16071
Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro			
	1120	1125	1130
gcc cct tct ggc tgc ccc ccc gac tcc gac gct gag tcc tat tcc tcc			16119
Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser			
	1135	1140	1145

atg ccc ccc ctg gag ggg gag cct ggg gat ccg gat ctt agc gac ggg	16167
Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly	
1150 1155 1160	
tca tgg tca acg gtc agt agt gag gcc aac gcg gag gat gtc gtg tgc	16215
Ser Trp Ser Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys	
1165 1170 1175	
tgc tca atg tct tac tct tgg aca ggc gca ctc gtc acc ccg tgc gcc	16263
Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala	
1180 1185 1190 1195	
gcg gaa gaa cag aaa ctg ccc atc aat gca cta agc aac tcg ttg cta	16311
Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu	
1200 1205 1210	
cgt cac cac aat ttg gtg tat tcc acc acc tca cgc agt gct tgc caa	16359
Arg His His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln	
1215 1220 1225	
agg cag aag aaa gtc aca ttt gac aga ctg caa gtt ctg gac agc cat	16407
Arg Gln Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His	
1230 1235 1240	
tac cag gac gta ctc aag gag gtt aaa gca gcg gcg tca aaa gtg aag	16455
Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys	
1245 1250 1255	
gct aac ttg cta tcc gta gag gaa gct tgc agc ctg acg ccc cca cac	16503
Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His	
1260 1265 1270 1275	
tca gcc aaa tcc aag ttt ggt tat ggg gca aaa gac gtc cgt tgc cat	16551
Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His	
1280 1285 1290	
gcc aga aag gcc gta acc cac atc aac tcc gtg tgg aaa gac ctt ctg	16599
Ala Arg Lys Ala Val Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu	
1295 1300 1305	
gaa gac aat gta aca cca ata gac act acc atc atg gct aag aac gag	16647
Glu Asp Asn Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu	
1310 1315 1320	
gtt ttc tgc gtt cag cct gag aag ggg ggt cgt aag cca gct cgt ctc	16695
Val Phe Cys Val Gln Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu	
1325 1330 1335	
atc gtg ttc ccc gat ctg ggc gtg cgc gtg tgc gaa aag atg gct ttg	16743
Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu	
1340 1345 1350 1355	
tac gac gtg gtt aca aag ctc ccc ttg gcc gtg atg gga agc tcc tac	16791
Tyr Asp Val Val Thr Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr	
1360 1365 1370	
gga ttc caa tac tca cca gga cag cgg gtt gaa ttc ctc gtg caa gcg	16839

Gly	Phe	Gln	Tyr	Ser	Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala		
		1375						1380						1385			
tgg	aag	tcc	aag	aaa	acc	cca	atg	ggg	ttc	tcg	tat	gat	acc	cgc	tgc	16887	
Trp	Lys	Ser	Lys	Lys	Thr	Pro	Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys		
		1390					1395					1400					
ttt	gac	tcc	aca	gtc	act	gag	agc	gac	atc	cgt	acg	gag	gag	gca	atc	16935	
Phe	Asp	Ser	Thr	Val	Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala	Ile		
		1405					1410				1415						
tac	caa	tgt	tgt	gac	ctc	gac	ccc	caa	gcc	cgc	gtg	gcc	atc	aag	tcc	16983	
Tyr	Gln	Cys	Cys	Asp	Leu	Asp	Pro	Gln	Ala	Arg	Val	Ala	Ile	Lys	Ser		
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ctc	acc	gag	agg	ctt	tat	gtt	ggg	ggc	cct	ctt	acc	aat	tca	agg	ggg	17031	
Leu	Thr	Glu	Arg	Leu	Tyr	Val	Gly	Gly	Pro	Leu	Thr	Asn	Ser	Arg	Gly		
			1440					1445						1450			
gag	aac	tgc	ggc	tat	cgc	agg	tgc	cgc	gcg	agc	ggc	gta	ctg	aca	act	17079	
Glu	Asn	Cys	Gly	Tyr	Arg	Arg	Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr		
		1455					1460					1465					
agc	tgt	ggt	aac	acc	ctc	act	tgc	tac	atc	aag	gcc	cgg	gca	gcc	tgt	17127	
Ser	Cys	Gly	Asn	Thr	Leu	Thr	Cys	Tyr	Ile	Lys	Ala	Arg	Ala	Ala	Cys		
		1470					1475				1480						
cga	gcc	gca	ggg	ctc	cag	gac	tgc	acc	atg	ctc	gtg	tgt	ggc	gac	gac	17175	
Arg	Ala	Ala	Gly	Leu	Gln	Asp	Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp		
		1485				1490				1495							
tta	gtc	gtt	atc	tgt	gaa	agc	gcg	ggg	gtc	cag	gag	gac	gcg	gcg	agc	17223	
Leu	Val	Val	Ile	Cys	Glu	Ser	Ala	Gly	Val	Gln	Glu	Asp	Ala	Ala	Ser		
		1500				1505				1510					1515		
ctg	aga	gcc	ttc	acg	gag	gct	atg	acc	agg	tac	tcc	gcc	ccc	cct	ggg	17271	
Leu	Arg	Ala	Phe	Thr	Glu	Ala	Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly		
			1520					1525					1530				
gac	ccc	cca	caa	cca	gaa	tac	gac	ttg	gag	ctc	ata	aca	tca	tgc	tcc	17319	
Asp	Pro	Pro	Gln	Pro	Glu	Tyr	Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser		
		1535					1540				1545						
tcc	aac	gtg	tca	gtc	gcc	cac	gac	ggc	gct	gga	aag	agg	gtc	tac	tac	17367	
Ser	Asn	Val	Ser	Val	Ala	His	Asp	Gly	Ala	Gly	Lys	Arg	Val	Tyr	Tyr		
		1550					1555				1560						
ctc	acc	cgt	gac	cct	aca	acc	ccc	ctc	gcg	aga	gct	gcg	tgg	gag	aca	17415	
Leu	Thr	Arg	Asp	Pro	Thr	Thr	Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr		
		1565				1570				1575							
gca	aga	cac	act	cca	gtc	aat	tcc	tgg	cta	ggc	aac	ata	atc	atg	ttt	17463	
Ala	Arg	His	Thr	Pro	Val	Asn	Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Phe		
		1580				1585				1590					1595		
gcc	ccc	aca	ctg	tgg	gcg	agg	atg	ata	ctg	atg	acc	cat	ttc	ttt	agc	17511	
Ala	Pro	Thr	Leu	Trp	Ala	Arg	Met	Ile	Leu	Met	Thr	His	Phe	Phe	Ser		

1600	1605	1610	
gtc ctt ata gcc agg gac cag ctt gaa cag gcc ctc gat tgc gag atc			17559
Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile			
1615	1620	1625	
tac ggg gcc tgc tac tcc ata gaa cca ctg gat cta cct cca atc att			17607
Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile			
1630	1635	1640	
caa aga ctc cat ggc ctc agc gca ttt tca ctc cac agt tac tct cca			17655
Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro			
1645	1650	1655	
ggg gaa atc aat agg gtg gcc gca tgc ctc aga aaa ctt ggg gta ccg			17703
Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro			
1660	1665	1670	1675
ccc ttg cga gct tgg aga cac cgg gcc cgg agc gtc cgc gct agg ctt			17751
Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu			
1680	1685	1690	
ctg gcc aga gga ggc agg gct gcc ata tgt ggc aag tac ctc ttc aac			17799
Leu Ala Arg Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn			
1695	1700	1705	
tgg gca gta aga aca aag ctc aaa ctc act cca ata gcg gcc gct ggc			17847
Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly			
1710	1715	1720	
cag ctg gac ttg tcc ggc tgg ttc acg gct ggc tac agc ggg gga gac			17895
Gln Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp			
1725	1730	1735	
att tat cac agc gtg tct cat gcc cgg ccc cgc tgg atc tgg ttt tgc			17943
Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys			
1740	1745	1750	1755
cta ctc ctg ctt gct gca ggg gta ggc atc tac ctc ctc ccc aac cga			17991
Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg			
1760	1765	1770	
atg agc acg aat cct aaa cct caa aga aag acc aaa cgt aac acc aac			18039
Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn			
1775	1780	1785	
cgg cgg ccg cag gac gtc aag ttc ccg ggt ggc ggt cag atc gtt ggt			18087
Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly			
1790	1795	1800	
gga gtt tac ttg ttg ccg cgc agg ggc cct aga ttg ggt gtg cgc gcg			18135
Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala			
1805	1810	1815	
acg aga aag act tcc gag cgg tcg caa cct cga ggt aga cgt cag cct			18183
Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro			
1820	1825	1830	1835

atc ccc aag gct cgt cgg ccc gag ggc agg acc tgg gct cag ccc ggg 18231  
 Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly  
 1840 1845 1850

tac cct tgg ccc ctc tat ggc aat gag ggc tgc ggg tgg gcg gga tgg 18279  
 Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp  
 1855 1860 1865

ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc ccc aca gac ccc 18327  
 Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro  
 1870 1875 1880

cgg cgt agg tgc cgc aat ttg ggt aag gtc atc gat acc ctt acg tgc 18375  
 Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys  
 1885 1890 1895

ggc ttc gcc gac ctc atg ggg tac ata ccg ctc gtc ggc gcc cct ctt 18423  
 Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu  
 1900 1905 1910 1915

gga ggc gct gcc agg gcc ctg gcg cat ggc gtc cgg gtt ctg gaa gac 18471  
 Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp  
 1920 1925 1930

ggc gtg aac tat gca aca ggg aac ctt cct ggt tgc tct taatagtcga 18520  
 Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser  
 1935 1940

ctttgttccc actgtacttt tagctcgtac aaaatacaat atacttttca tttctccgta 18580  
 aacaacatgt tttcccatgt aatatccttt tctatttttc gttccgttac caactttaca 18640  
 catactttat atagctattc acttctatac actaaaaaac taagacaatt ttaattttgc 18700  
 tgccctgcat atttcaattt gttataaatt cctataattt atcctattag tagctaaaaa 18760  
 aagatgaatg tgaatcgaat cctaagagaa ttggatctga tccacaggac ggggtgtggtc 18820  
 gccatgatcg cgtagtcgat agtggctcca agtagcgaag cgagcaggac tggggcggcg 18880  
 ccaaagcggg cggacagtgc tccgagaacg ggtgcgcata gaaattgcat caacgcata 18940  
 agcgctagca gcacgccata gtgactggcg atgctgtcgg aatggacgat atcccgaag 19000  
 agggccggca gtaccggcat aaccaagcct atgcctacag catccagggt gacggtgccg 19060  
 aggatgacga tgagcgcatt gttagatttc atacacgggt cctgactgcg ttagcaattt 19120  
 aactgtgata aactaccgca ttaaagcttt ttctttccaa tttttttttt ttcgtcatta 19180  
 taaaaatcat tacgaccgag attcccgggt aataactgat ataattaaat tgaagctcta 19240  
 atttgtgagt ttagtataca tgcatttact tataatacag ttttttagtt ttgctggccg 19300  
 catctttctca aatatgcttc ccagcctgct tttctgtaac gttcaccctc taccttagca 19360  
 tcccttcctt ttgcaaatag tcctcttcca acaataataa tgtcagatcc tgtagagacc 19420

acatcatcca cggttctata ctgttgaccc aatgcgtctc ccttgtcatc taaaccacaca 19480  
 ccgggtgtca taatcaacca atcgtaacct tcatctcttc cacccatgtc tctttgagca 19540  
 ataaagccga taacaaaatc tttgtcgctc ttcgcaatgt caacagtacc cttagtatat 19600  
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 tccacatgtg tttttagtaa acaaattttg ggacctaatg cttcaactaa ctccagtaat 19960  
 tccttggtgg tacgaacatc caatgaagca cacaagtttg tttgcttttc gtgcatgata 20020  
 ttaaatagct tggcagcaac aggactagga tgagtagcag cacgttcctt atatgtagct 20080  
 ttcgacatga tttatcttcg tttctgcag gttttgttc tgtgcagttg ggtaagaat 20140  
 actgggcaat ttcatgtttc ttcaacta catatgcgta tatataccaa tctaagtctg 20200  
 tgctccttcc ttcgttcttc cttctgttcg gagattaccg aatcaaaaaa atttcaagga 20260  
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<210> 15  
 <211> 1944  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 pd.delta.NS3NS5.pj.core173

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 Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly  
 35 40 45  
 Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
 50 55 60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
 65 70 75 80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala

85					90					95					
Glu	Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro
			100						105				110		
Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser
		115					120					125			
Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile	Pro	Leu	Glu	Val
	130					135					140				
Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys
145					150					155					160
Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala	Leu	Gly	Ile	Asn	Ala	Val	Ala
				165						170				175	
Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val
			180					185					190		
Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Tyr	Thr	Gly	Asp	Phe
		195					200					205			
Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe
	210					215					220				
Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Ile	Thr	Leu	Pro	Gln	Asp
225					230					235					240
Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Lys	Pro
				245					250					255	
Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe
			260					265					270		
Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr
		275					280					285			
Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu	Arg	Ala	Tyr	Met	Asn
	290					295					300				
Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly
305					310					315					320
Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr
				325					330					335	
Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr
			340					345					350		
Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp
		355					360					365			
Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu
	370					375					380				
Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Ile	Thr	Leu	Thr	His	Pro

385		390		395		400
Val Thr Lys Tyr	Ile Met Thr Cys Met	Ser Ala Asp Leu Glu	Val Val			
	405	410	415			
Thr Ser Thr Trp	Val Leu Val Gly Gly	Val Leu Ala Ala	Leu Ala Ala			
	420	425	430			
Tyr Cys Leu Ser	Thr Gly Cys Val Val	Ile Val Gly Arg	Val Val Leu			
	435	440	445			
Ser Gly Lys Pro	Ala Ile Ile Pro Asp Arg	Glu Val Leu Tyr Arg	Glu			
	450	455	460			
Phe Asp Glu Met	Glu Glu Cys Ser Gln His	Leu Pro Tyr Ile Glu	Gln			
465	470	475	480			
Gly Met Met Leu	Ala Glu Gln Phe Lys Gln Lys	Ala Leu Gly Leu Leu				
	485	490	495			
Gln Thr Ala Ser	Arg Gln Ala Glu Val Ile Ala Pro	Ala Val Gln Thr				
	500	505	510			
Asn Trp Gln Lys	Leu Glu Thr Phe Trp Ala Lys His	Met Trp Asn Phe				
	515	520	525			
Ile Ser Gly Ile	Gln Tyr Leu Ala Gly Leu Ser Thr	Leu Pro Gly Asn				
	530	535	540			
Pro Ala Ile Ala	Ser Leu Met Ala Phe Thr Ala Ala	Val Thr Ser Pro				
545	550	555	560			
Leu Thr Thr Ser	Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly	Trp Val				
	565	570	575			
Ala Ala Gln Leu	Ala Ala Pro Gly Ala Ala Thr Ala Phe	Val Gly Ala				
	580	585	590			
Gly Leu Ala Gly	Ala Ala Ile Gly Ser Val Gly Leu Gly Lys	Val Leu				
	595	600	605			
Ile Asp Ile Leu	Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala	Leu Val				
	610	615	620			
Ala Phe Lys Ile	Met Ser Gly Glu Val Pro Ser Thr Glu Asp	Leu Val				
625	630	635	640			
Asn Leu Leu Pro	Ala Ile Leu Ser Pro Gly Ala Leu Val Val	Gly Val				
	645	650	655			
Val Cys Ala Ala	Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly	Ala				
	660	665	670			
Val Gln Trp Met	Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly	Asn His				
	675	680	685			
Val Ser Pro Thr	His Tyr Val Pro Glu Ser Asp Ala Ala Ala	Arg Val				



690	695	700
Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu 705 710 715 720		
His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp 725 730 735		
Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys 740 745 750		
Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe 755 760 765		
Val Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile 770 775 780		
Met His Thr Arg Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys 785 790 795 800		
Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp 805 810 815		
Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro 820 825 830		
Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp Arg Val Ser Ala Glu 835 840 845		
Glu Tyr Val Glu Ile Arg Gln Val Gly Asp Phe His Tyr Val Thr Gly 850 855 860		
Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln Val Pro Ser Pro Glu 865 870 875 880		
Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro 885 890 895		
Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His 900 905 910		
Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val 915 920 925		
Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu 930 935 940		
Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Val Ala Ser 945 950 955 960		
Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr 965 970 975		
Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu 980 985 990		
Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn		

995	1000	1005
Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp 1010	1015	1020
Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg 1025	1030	1035 1040
Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro 1045	1050	1055
Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His 1060	1065	1070
Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg 1075	1080	1085
Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu 1090	1095	1100
Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile 1105	1110	1115 1120
Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys 1125	1130	1135
Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu 1140	1145	1150
Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val 1155	1160	1165
Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met Ser Tyr 1170	1175	1180
Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys 1185	1190	1195 1200
Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu 1205	1210	1215
Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val 1220	1225	1230
Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu 1235	1240	1245
Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser 1250	1255	1260
Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys 1265	1270	1275 1280
Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val 1285	1290	1295

Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu Glu Asp Asn Val Thr  
 1300 1305 1310  
 Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln  
 1315 1320 1325  
 Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp  
 1330 1335 1340  
 Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Thr  
 1345 1350 1355 1360  
 Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser  
 1365 1370 1375  
 Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys  
 1380 1385 1390  
 Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val  
 1395 1400 1405  
 Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp  
 1410 1415 1420  
 Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu  
 1425 1430 1435 1440  
 Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr  
 1445 1450 1455  
 Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr  
 1460 1465 1470  
 Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu  
 1475 1480 1485  
 Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys  
 1490 1495 1500  
 Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr  
 1505 1510 1515 1520  
 Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro  
 1525 1530 1535  
 Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val  
 1540 1545 1550  
 Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro  
 1555 1560 1565  
 Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro  
 1570 1575 1580  
 Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp  
 1585 1590 1595 1600

Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg  
 1605 1610 1615  
 Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile Tyr Gly Ala Cys Tyr  
 1620 1625 1630  
 Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly  
 1635 1640 1645  
 Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg  
 1650 1655 1660  
 Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp  
 1665 1670 1675 1680  
 Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg Gly Gly  
 1685 1690 1695  
 Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr  
 1700 1705 1710  
 Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp Leu Ser  
 1715 1720 1725  
 Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val  
 1730 1735 1740  
 Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu Leu Ala  
 1745 1750 1755 1760  
 Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg Met Ser Thr Asn Pro  
 1765 1770 1775  
 Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp  
 1780 1785 1790  
 Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val Tyr Leu Leu  
 1795 1800 1805  
 Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala Thr Arg Lys Thr Ser  
 1810 1815 1820  
 Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys Ala Arg  
 1825 1830 1835 1840  
 Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly Tyr Pro Trp Pro Leu  
 1845 1850 1855  
 Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp Leu Leu Ser Pro Arg  
 1860 1865 1870  
 Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro Arg Arg Ser Arg  
 1875 1880 1885  
 Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys Gly Phe Ala Asp Leu  
 1890 1895 1900

Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu Gly Gly Ala Ala Arg  
 1905 1910 1915 1920

Ala Leu Ala His Gly Val Arg Val Leu Glu Asp Gly Val Asn Tyr Ala  
 1925 1930 1935

Thr Gly Asn Leu Pro Gly Cys Ser  
 1940

<210> 16  
 <211> 20217  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 pd.delta.NS3NS5.pj.core140

<220>  
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 cggatcaacg ttcttaatat cgctgaatct tccacaattg atgaaagtag ctaggaagag 180  
 gaattggtat aaagtttttg tttttgtaaa tctcgaagta tactcaaacg aatttagtat 240  
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 ccaagcagga atcaatttct ttaatgaggc ttccagaatt gttgcttttt gcgtcttgta 480  
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 cggatatctc atttcatatt ttaaaaatgc acctttgctg cttttcctta attttagac 960  
 ggcccgagg ttcgttttgc ggtactatct tgtgataaaa agttgttttg acatgtgatc 1020

tgcacagatt ttataatgta ataagcaaga atacattatc aaacgaacaa tactggtaaa 1080  
 agaaaaccaa aatggacgac attgaaacag ccaagaatct gacggtaaaa gcacgtacag 1140  
 cttatagcgt ctgggatgta tgtcggctgt ttattgaaat gattgctcct gatgtagata 1200  
 ttgatataga gagtaaactg aagtctgatg agctactctt tccaggatat gtcataaggc 1260  
 ccatggaatc tctcacaacc ggtaggccgt atgggtcttga ttctagcgca gaagattcca 1320  
 gcgtatcttc tgactccagt gctgaggtaa ttttgcttgc tgcgaagatg gttaaggaaa 1380  
 ggtttgattc gattggaaat ggtatgctct cttcacaaga agcaagtcag gctgccatag 1440  
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 ctataataat aggaagattg cccgagaaag acaagaagag agctaccgaa atgctcatga 1560  
 gaaaaatgga ttgtacacag ttattagtcc caccagctcc aacggaagaa gatgttatga 1620  
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 caagaggagc atataaatta caaaacacca tcaactgaggg ccctaaagcg gttcccacga 1920  
 aaaaaaggag agtagcaacg agggtaaggg gcagaaaatc acgtaatact tctaggggat 1980  
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Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	
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ggc	tgt	gct	tgg	tat	gag	ctc	acg	ccc	gcc	gag	act	aca	gtt	agg	cta	13575
Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu	

285	290	295	
cga gcg tac atg aac acc ccg ggg ctt ccc gtg tgc cag gac cat ctt			13623
Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu			
300	305	310	315
gaa ttt tgg gag ggc gtc ttt aca ggc ctc act cat ata gat gcc cac			13671
Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His			
	320	325	330
ttt cta tcc cag aca aag cag agt ggg gag aac ctt cct tac ctg gta			13719
Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val			
	335	340	345
gcg tac caa gcc acc gtg tgc gct agg gct caa gcc cct ccc cca tcg			13767
Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser			
	350	355	360
tgg gac cag atg tgg aag tgt ttg att cgc ctc aag ccc acc ctc cat			13815
Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His			
	365	370	375
ggg cca aca ccc ctg cta tac aga ctg ggc gct gtt cag aat gaa atc			13863
Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Ile			
380	385	390	395
acc ctg acg cac cca gtc acc aaa tac atc atg aca tgc atg tcg gcc			13911
Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met Ser Ala			
	400	405	410
gac ctg gag gtc gtc acg agc acc tgg gtg ctc gtt ggc ggc gtc ctg			13959
Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu			
	415	420	425
gct gct ttg gcc gcg tat tgc ctg tca aca ggc tgc gtg gtc ata gtg			14007
Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val Ile Val			
	430	435	440
ggc agg gtc gtc ttg tcc ggg aag ccg gca atc ata cct gac agg gaa			14055
Gly Arg Val Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu			
	445	450	455
gtc ctc tac cga gag ttc gat gag atg gaa gag tgc tct cag cac tta			14103
Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys Ser Gln His Leu			
460	465	470	475
ccg tac atc gag caa ggg atg atg ctc gcc gag cag ttc aag cag aag			14151
Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe Lys Gln Lys			
	480	485	490
gcc ctc ggc ctc ctg cag acc gcg tcc cgt cag gca gag gtt atc gcc			14199
Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg Gln Ala Glu Val Ile Ala			
	495	500	505
cct gct gtc cag acc aac tgg caa aaa ctc gag acc ttc tgg gcg aag			14247
Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Thr Phe Trp Ala Lys			
	510	515	520

cat atg tgg aac ttc atc agt ggg ata caa tac ttg gcg ggc ttg tca	14295
His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser	
525 530 535	
acg ctg cct ggt aac ccc gcc att gct tca ttg atg gct ttt aca gct	14343
Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala	
540 545 550 555	
gct gtc acc agc cca cta acc act agc caa acc ctc ctc ttc aac ata	14391
Ala Val Thr Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu Phe Asn Ile	
560 565 570	
ttg ggg ggg tgg gtg gct gcc cag ctc gcc gcc ccc ggt gcc gct act	14439
Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly Ala Ala Thr	
575 580 585	
gcc ttt gtg ggc gct ggc tta gct ggc gcc gcc atc ggc agt gtt gga	14487
Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly Ser Val Gly	
590 595 600	
ctg ggg aag gtc ctc ata gac atc ctt gca ggg tat ggc gcg ggc gtg	14535
Leu Gly Lys Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val	
605 610 615	
gcg gga gct ctt gtg gca ttc aag atc atg agc ggt gag gtc ccc tcc	14583
Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Val Pro Ser	
620 625 630 635	
acg gag gac ctg gtc aat cta ctg ccc gcc atc ctc tcg ccc gga gcc	14631
Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala	
640 645 650	
ctc gta gtc ggc gtg gtc tgt gca gca ata ctg cgc cgg cac gtt ggc	14679
Leu Val Val Gly Val Val Cys Ala Ala Ile Leu Arg Arg His Val Gly	
655 660 665	
ccg ggc gag ggg gca gtg cag tgg atg aac cgg ctg ata gcc ttc gcc	14727
Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala	
670 675 680	
tcc cgg ggg aac cat gtt tcc ccc acg cac tac gtg ccg gag agc gat	14775
Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp	
685 690 695	
gca gct gcc cgc gtc act gcc ata ctc agc agc ctc act gta acc cag	14823
Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln	
700 705 710 715	
ctc ctg agg cga ctg cac cag tgg ata agc tcg gag tgt acc act cca	14871
Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro	
720 725 730	
tgc tcc ggt tcc tgg cta agg gac atc tgg gac tgg ata tgc gag gtg	14919
Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val	
735 740 745	
ttg agc gac ttt aag acc tgg cta aaa gct aag ctc atg cca cag ctg	14967

Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu		
		750					755					760					
cct	ggg	atc	ccc	ttt	gtg	tcc	tgc	cag	cgc	ggg	tat	aag	ggg	gtc	tgg	15015	
Pro	Gly	Ile	Pro	Phe	Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp		
	765					770					775						
cga	ggg	gac	ggc	atc	atg	cac	act	cgc	tgc	cac	tgt	gga	gct	gag	atc	15063	
Arg	Gly	Asp	Gly	Ile	Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile		
	780				785					790					795		
act	gga	cat	gtc	aaa	aac	ggg	acg	atg	agg	atc	gtc	ggg	cct	agg	acc	15111	
Thr	Gly	His	Val	Lys	Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr		
				800					805					810			
tgc	agg	aac	atg	tgg	agt	ggg	acc	ttc	ccc	att	aat	gcc	tac	acc	acg	15159	
Cys	Arg	Asn	Met	Trp	Ser	Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr		
		815						820					825				
ggc	ccc	tgt	acc	ccc	ctt	cct	gcg	ccg	aac	tac	acg	ttc	gcg	cta	tgg	15207	
Gly	Pro	Cys	Thr	Pro	Leu	Pro	Ala	Pro	Asn	Tyr	Thr	Phe	Ala	Leu	Trp		
		830					835					840					
agg	gtg	tct	gca	gag	gaa	tac	gtg	gag	ata	agg	cag	gtg	ggg	gac	ttc	15255	
Arg	Val	Ser	Ala	Glu	Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	Asp	Phe		
	845					850					855						
cac	tac	gtg	acg	ggg	atg	act	act	gac	aac	ctt	aaa	tgc	ccg	tgc	cag	15303	
His	Tyr	Val	Thr	Gly	Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln		
	860				865					870					875		
gtc	cca	tcg	ccc	gaa	ttt	ttc	aca	gaa	ttg	gac	ggg	gtg	cgc	cta	cat	15351	
Val	Pro	Ser	Pro	Glu	Phe	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His		
				880					885					890			
agg	ttt	gcg	ccc	ccc	tgc	aag	ccc	ttg	ctg	cgg	gag	gag	gta	tca	ttc	15399	
Arg	Phe	Ala	Pro	Pro	Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe		
			895					900					905				
aga	gta	gga	ctc	cac	gaa	tac	ccg	gta	ggg	tcg	caa	tta	cct	tgc	gag	15447	
Arg	Val	Gly	Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu		
	910						915					920					
ccc	gaa	ccg	gac	gtg	gcc	gtg	ttg	acg	tcc	atg	ctc	act	gat	ccc	tcc	15495	
Pro	Glu	Pro	Asp	Val	Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser		
	925					930					935						
cat	ata	aca	gca	gag	gcg	gcc	ggg	cga	agg	ttg	gcg	agg	gga	tca	ccc	15543	
His	Ile	Thr	Ala	Glu	Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro		
	940				945					950					955		
ccc	tct	gtg	gcc	agc	tcc	tcg	gct	agc	cag	cta	tcc	gct	cca	tct	ctc	15591	
Pro	Ser	Val	Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu		
				960					965					970			
aag	gca	act	tgc	acc	gct	aac	cat	gac	tcc	cct	gat	gct	gag	ctc	ata	15639	
Lys	Ala	Thr	Cys	Thr	Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile		



975	980	985	
gag gcc aac ctc cta tgg agg	cag gag atg ggc ggc aac atc acc agg		15687
Glu Ala Asn Leu Leu Trp Arg	Gln Glu Met Gly Gly Asn Ile Thr Arg		
990	995	1000	
gtt gag tca gaa aac aaa gtg gtg att ctg gac tcc ttc gat ccg ctt			15735
Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu			
1005	1010	1015	
gtg gcg gag gag gac gag cgg gag atc tcc gta ccc gca gaa atc ctg			15783
Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu			
1020	1025	1030	1035
cgg aag tct cgg aga ttc gcc cag gcc ctg ccc gtt tgg gcg cgg ccg			15831
Arg Lys Ser Arg Arg Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro			
1040	1045	1050	
gac tat aac ccc ccg cta gtg gag acg tgg aaa aag ccc gac tac gaa			15879
Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu			
1055	1060	1065	
cca cct gtg gtc cat ggc tgc ccg ctt cca cct cca aag tcc cct cct			15927
Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro			
1070	1075	1080	
gtg cct ccg cct cgg aag aag cgg acg gtg gtc ctc act gaa tca acc			15975
Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr			
1085	1090	1095	
cta tct act gcc ttg gcc gag ctc gcc acc aga agc ttt ggc agc tcc			16023
Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser			
1100	1105	1110	1115
tca act tcc ggc att acg ggc gac aat acg aca aca tcc tct gag ccc			16071
Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro			
1120	1125	1130	
gcc cct tct ggc tgc ccc ccc gac tcc gac gct gag tcc tat tcc tcc			16119
Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser			
1135	1140	1145	
atg ccc ccc ctg gag ggg gag cct ggg gat ccg gat ctt agc gac ggg			16167
Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly			
1150	1155	1160	
tca tgg tca acg gtc agt agt gag gcc aac gcg gag gat gtc gtg tgc			16215
Ser Trp Ser Thr Val Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys			
1165	1170	1175	
tgc tca atg tct tac tct tgg aca ggc gca ctc gtc acc ccg tgc gcc			16263
Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala			
1180	1185	1190	1195
gcg gaa gaa cag aaa ctg ccc atc aat gca cta agc aac tcg ttg cta			16311
Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu			
1200	1205	1210	

cg	t	c	a	c	a	a	t	t	g	g	t	a	t	t	c	c	a	c	c	t	c	a	c	g	a	g	t	g	c	a		16359	
Arg	His	His	Asn	Leu	Val	Tyr	Ser	Thr	Thr	Ser	Arg	Ser	Ala	Cys	Gln																		
			1215							1220					1225																		
agg	cag	aag	aaa	gtc	aca	ttt	gac	aga	ctg	caa	gtt	ctg	gac	agc	cat																	16407	
Arg	Gln	Lys	Lys	Val	Thr	Phe	Asp	Arg	Leu	Gln	Val	Leu	Asp	Ser	His																		
		1230					1235						1240																				
tac	cag	gac	gta	ctc	aag	gag	gtt	aaa	gca	gcg	gcg	tca	aaa	gtg	aag																	16455	
Tyr	Gln	Asp	Val	Leu	Lys	Glu	Val	Lys	Ala	Ala	Ala	Ser	Lys	Val	Lys																		
		1245					1250					1255																					
gct	aac	ttg	cta	tcc	gta	gag	gaa	gct	tgc	agc	ctg	acg	ccc	cca	cac																	16503	
Ala	Asn	Leu	Leu	Ser	Val	Glu	Glu	Ala	Cys	Ser	Leu	Thr	Pro	Pro	His																		
		1260				1265				1270					1275																		
tca	gcc	aaa	tcc	aag	ttt	ggt	tat	ggg	gca	aaa	gac	gtc	cgt	tgc	cat																		16551
Ser	Ala	Lys	Ser	Lys	Phe	Gly	Tyr	Gly	Ala	Lys	Asp	Val	Arg	Cys	His																		
			1280						1285						1290																		
gcc	aga	aag	gcc	gta	acc	cac	atc	aac	tcc	gtg	tgg	aaa	gac	ctt	ctg																	16599	
Ala	Arg	Lys	Ala	Val	Thr	His	Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu																		
			1295						1300						1305																		
gaa	gac	aat	gta	aca	cca	ata	gac	act	acc	atc	atg	gct	aag	aac	gag																	16647	
Glu	Asp	Asn	Val	Thr	Pro	Ile	Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu																		
			1310						1315						1320																		
gtt	ttc	tgc	gtt	cag	cct	gag	aag	ggg	ggt	cgt	aag	cca	gct	cgt	ctc																	16695	
Val	Phe	Cys	Val	Gln	Pro	Glu	Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu																		
			1325						1330						1335																		
atc	gtg	ttc	ccc	gat	ctg	ggc	gtg	cgc	gtg	tgc	gaa	aag	atg	gct	ttg																	16743	
Ile	Val	Phe	Pro	Asp	Leu	Gly	Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu																		
			1340				1345				1350				1355																		
tac	gac	gtg	gtt	aca	aag	ctc	ccc	ttg	gcc	gtg	atg	gga	agc	tcc	tac																	16791	
Tyr	Asp	Val	Val	Thr	Lys	Leu	Pro	Leu	Ala	Val	Met	Gly	Ser	Ser	Tyr																		
					1360					1365					1370																		
gga	ttc	caa	tac	tca	cca	gga	cag	cgg	gtt	gaa	ttc	ctc	gtg	caa	gcg																	16839	
Gly	Phe	Gln	Tyr	Ser	Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala																		
			1375						1380						1385																		
tgg	aag	tcc	aag	aaa	acc	cca	atg	ggg	ttc	tcg	tat	gat	acc	cgc	tgc																	16887	
Trp	Lys	Ser	Lys	Lys	Thr	Pro	Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys																		
			1390						1395						1400																		
ttt	gac	tcc	aca	gtc	act	gag	agc	gac	atc	cgt	acg	gag	gag	gca	atc																	16935	
Phe	Asp	Ser	Thr	Val	Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala	Ile																		
			1405						1410						1415																		
tac	caa	tgt	tgt	gac	ctc	gac	ccc	caa	gcc	cgc	gtg	gcc	atc	aag	tcc																	16983	
Tyr	Gln	Cys	Cys	Asp	Leu	Asp	Pro	Gln	Ala	Arg	Val	Ala	Ile	Lys	Ser																		
			1420				1425					1430			1435																		
ctc	acc	gag	agg	ctt	tat	gtt	ggg	ggc	cct	ctt	acc	aat	tca	agg	ggg																	17031	

Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly	
1440 1445 1450	
gag aac tgc ggc tat cgc agg tgc cgc gcg agc ggc gta ctg aca act	17079
Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr	
1455 1460 1465	
agc tgt ggt aac acc ctc act tgc tac atc aag gcc cgg gca gcc tgt	17127
Ser Cys Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys	
1470 1475 1480	
cga gcc gca ggg ctc cag gac tgc acc atg ctc gtg tgt ggc gac gac	17175
Arg Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp	
1485 1490 1495	
tta gtc gtt atc tgt gaa agc gcg ggg gtc cag gag gac gcg gcg agc	17223
Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser	
1500 1505 1510 1515	
ctg aga gcc ttc acg gag gct atg acc agg tac tcc gcc ccc cct ggg	17271
Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly	
1520 1525 1530	
gac ccc cca caa cca gaa tac gac ttg gag ctc ata aca tca tgc tcc	17319
Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser	
1535 1540 1545	
tcc aac gtg tca gtc gcc cac gac ggc gct gga aag agg gtc tac tac	17367
Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr	
1550 1555 1560	
ctc acc cgt gac cct aca acc ccc ctc gcg aga gct gcg tgg gag aca	17415
Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr	
1565 1570 1575	
gca aga cac act cca gtc aat tcc tgg cta ggc aac ata atc atg ttt	17463
Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe	
1580 1585 1590 1595	
gcc ccc aca ctg tgg gcg agg atg ata ctg atg acc cat ttc ttt agc	17511
Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser	
1600 1605 1610	
gtc ctt ata gcc agg gac cag ctt gaa cag gcc ctc gat tgc gag atc	17559
Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile	
1615 1620 1625	
tac ggg gcc tgc tac tcc ata gaa cca ctg gat cta cct cca atc att	17607
Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile	
1630 1635 1640	
caa aga ctc cat ggc ctc agc gca ttt tca ctc cac agt tac tct cca	17655
Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro	
1645 1650 1655	
ggt gaa atc aat agg gtg gcc gca tgc ctc aga aaa ctt ggg gta ccg	17703
Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro	

1660	1665	1670	1675	
ccc ttg cga gct tgg aga cac cgg gcc cgg agc gtc cgc gct agg ctt				17751
Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu				
1680		1685	1690	
ctg gcc aga gga ggc agg gct gcc ata tgt ggc aag tac ctc ttc aac				17799
Leu Ala Arg Gly Gly Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn				
1695		1700	1705	
tgg gca gta aga aca aag ctc aaa ctc act cca ata gcg gcc gct ggc				17847
Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly				
1710		1715	1720	
cag ctg gac ttg tcc ggc tgg ttc acg gct ggc tac agc ggg gga gac				17895
Gln Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp				
1725		1730	1735	
att tat cac agc gtg tct cat gcc cgg ccc cgc tgg atc tgg ttt tgc				17943
Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys				
1740		1745	1750	1755
cta ctc ctg ctt gct gca ggg gta ggc atc tac ctc ctc ccc aac cga				17991
Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg				
1760		1765	1770	
atg agc acg aat cct aaa cct caa aga aag acc aaa cgt aac acc aac				18039
Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn				
1775		1780	1785	
cgg cgg ccg cag gac gtc aag ttc ccg ggt ggc ggt cag atc gtt ggt				18087
Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly				
1790		1795	1800	
gga gtt tac ttg ttg ccg cgc agg ggc cct aga ttg ggt gtg cgc gcg				18135
Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala				
1805		1810	1815	
acg aga aag act tcc gag cgg tcg caa cct cga ggt aga cgt cag cct				18183
Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro				
1820		1825	1830	1835
atc ccc aag gct cgt cgg ccc gag ggc agg acc tgg gct cag ccc ggg				18231
Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly				
1840		1845	1850	
tac cct tgg ccc ctc tat ggc aat gag ggc tgc ggg tgg gcg gga tgg				18279
Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp				
1855		1860	1865	
ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc ccc aca gac ccc				18327
Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro				
1870		1875	1880	
cgg cgt agg tcg cgc aat ttg ggt aag gtc atc gat acc ctt acg tgc				18375
Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys				
1885		1890	1895	

ggc ttc gcc gac ctc atg ggg tac ata ccg ctc gtc taatagtcga 18421  
 Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val  
 1900 1905 1910

ctttgttccc actgtacttt tagctcgtag aaaatacaat atacttttca tttctccgta 18481  
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<220>  
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 pd.delta.NS3NS5.pj.core140

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 35 40 45  
 Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
 50 55 60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
 65 70 75 80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
 85 90 95  
 Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
 100 105 110  
 Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
 115 120 125  
 Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
 130 135 140  
 Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
 145 150 155 160  
 Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
 165 170 175  
 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
 180 185 190  
 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
 195 200 205

Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	210	215	220
Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Ile	Thr	Leu	Pro	Gln	Asp	225	230	235
Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Lys	Pro	245	250	255
Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	260	265	270
Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	275	280	285
Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	Arg	Leu	Arg	Ala	Tyr	Met	Asn	290	295	300
Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	305	310	315
Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	325	330	335
Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	340	345	350
Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	355	360	365
Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	370	375	380
Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Ile	Thr	Leu	Thr	His	Pro	385	390	395
Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	405	410	415
Thr	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	420	425	430
Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val	Ile	Val	Gly	Arg	Val	Val	Leu	435	440	445
Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	450	455	460
Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser	Gln	His	Leu	Pro	Tyr	Ile	Glu	Gln	465	470	475
Gly	Met	Met	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Leu	Gly	Leu	Leu	485	490	495
Gln	Thr	Ala	Ser	Arg	Gln	Ala	Glu	Val	Ile	Ala	Pro	Ala	Val	Gln	Thr	500	505	510

Asn	Trp	Gln	Lys	Leu	Glu	Thr	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	515	520	525
Ile	Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	530	535	540
Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ala	Val	Thr	Ser	Pro	545	550	555
Leu	Thr	Thr	Ser	Gln	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	565	570	575
Ala	Ala	Gln	Leu	Ala	Ala	Pro	Gly	Ala	Ala	Thr	Ala	Phe	Val	Gly	Ala	580	585	590
Gly	Leu	Ala	Gly	Ala	Ala	Ile	Gly	Ser	Val	Gly	Leu	Gly	Lys	Val	Leu	595	600	605
Ile	Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	610	615	620
Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu	Val	Pro	Ser	Thr	Glu	Asp	Leu	Val	625	630	635
Asn	Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	645	650	655
Val	Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	660	665	670
Val	Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	675	680	685
Val	Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	690	695	700
Thr	Ala	Ile	Leu	Ser	Ser	Leu	Thr	Val	Thr	Gln	Leu	Leu	Arg	Arg	Leu	705	710	715
His	Gln	Trp	Ile	Ser	Ser	Glu	Cys	Thr	Thr	Pro	Cys	Ser	Gly	Ser	Trp	725	730	735
Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	Glu	Val	Leu	Ser	Asp	Phe	Lys	740	745	750
Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu	Pro	Gly	Ile	Pro	Phe	755	760	765
Val	Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	770	775	780
Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile	Thr	Gly	His	Val	Lys	785	790	795
Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Arg	Asn	Met	Trp	805	810	815



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 Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp Arg Val Ser Ala Glu  
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 Glu Tyr Val Glu Ile Arg Gln Val Gly Asp Phe His Tyr Val Thr Gly  
 850 855 860  
 Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln Val Pro Ser Pro Glu  
 865 870 875 880  
 Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro  
 885 890 895  
 Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His  
 900 905 910  
 Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val  
 915 920 925  
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 930 935 940  
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 945 950 955 960  
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 980 985 990  
 Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn  
 995 1000 1005  
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 1010 1015 1020  
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 Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg  
 1075 1080 1085  
 Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu  
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Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys  
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 Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu  
 1140 1145 1150  
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 Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu  
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 Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu  
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 1250 1255 1260  
 Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys  
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 Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val  
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 Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu Glu Asp Asn Val Thr  
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 Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val  
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Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu  
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 Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr  
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 Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu  
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 Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val  
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 Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro  
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 Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro  
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 Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp  
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 pd.delta.NS3NS5.pj.core150

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Thr	Leu	Pro	Gly	Asn	Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	
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gct	gtc	acc	agc	cca	cta	acc	act	agc	caa	acc	ctc	ctc	ttc	aac	ata	14391
Ala	Val	Thr	Ser	Pro	Leu	Thr	Thr	Ser	Gln	Thr	Leu	Leu	Phe	Asn	Ile	
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ttg	ggg	ggg	tgg	gtg	gct	gcc	cag	ctc	gcc	gcc	ccc	ggt	gcc	gct	act	14439
Leu	Gly	Gly	Trp	Val	Ala	Ala	Gln	Leu	Ala	Ala	Pro	Gly	Ala	Ala	Thr	
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gcc	ttt	gtg	ggc	gct	ggc	tta	gct	ggc	gcc	gcc	atc	ggc	agt	gtt	gga	14487
Ala	Phe	Val	Gly	Ala	Gly	Leu	Ala	Gly	Ala	Ala	Ile	Gly	Ser	Val	Gly	
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Leu	Gly	Lys	Val	Leu	Ile	Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	
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gcg	gga	gct	ctt	gtg	gca	ttc	aag	atc	atg	agc	ggt	gag	gtc	ccc	tcc	14583
Ala	Gly	Ala	Leu	Val	Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu	Val	Pro	Ser	
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Thr	Glu	Asp	Leu	Val	Asn	Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	

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Leu	Val	Val	Gly	Val	Val	Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly					
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Pro	Gly	Glu	Gly	Ala	Val	Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala					
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Ser	Arg	Gly	Asn	His	Val	Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp					
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Ala	Ala	Ala	Arg	Val	Thr	Ala	Ile	Leu	Ser	Ser	Leu	Thr	Val	Thr	Gln					
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Leu	Leu	Arg	Arg	Leu	His	Gln	Trp	Ile	Ser	Ser	Glu	Cys	Thr	Thr	Pro					
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tgc	tcc	ggt	tcc	tgg	cta	agg	gac	atc	tgg	gac	tgg	ata	tgc	gag	gtg	14919				
Cys	Ser	Gly	Ser	Trp	Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	Glu	Val					
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ttg	agc	gac	ttt	aag	acc	tgg	cta	aaa	gct	aag	ctc	atg	cca	cag	ctg	14967				
Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu					
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cga	ggg	gac	ggc	atc	atg	cac	act	cgc	tgc	cac	tgt	gga	gct	gag	atc	15063				
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Arg	Val	Ser	Ala	Glu	Glu	Tyr	Val	Glu	Ile	Arg	Gln	Val	Gly	Asp	Phe					
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Val Pro Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His	
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Arg Phe Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe	
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Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu	
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Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser	
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His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro	
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Pro Ser Val Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu	
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Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile	
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Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg	
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Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu	
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Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu	
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Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu	
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Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro	
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Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr	
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Ala	Pro	Ser	Gly	Cys	Pro	Pro	Asp	Ser	Asp	Ala	Glu	Ser	Tyr	Ser	Ser	
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Met	Pro	Pro	Leu	Glu	Gly	Glu	Pro	Gly	Asp	Pro	Asp	Leu	Ser	Asp	Gly	
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Ser	Trp	Ser	Thr	Val	Ser	Ser	Glu	Ala	Asn	Ala	Glu	Asp	Val	Val	Cys	
	1165				1170				1175							
tgc	tca	atg	tct	tac	tct	tgg	aca	ggc	gca	ctc	gtc	acc	ccg	tgc	gcc	16263
Cys	Ser	Met	Ser	Tyr	Ser	Trp	Thr	Gly	Ala	Leu	Val	Thr	Pro	Cys	Ala	
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Ala	Glu	Glu	Gln	Lys	Leu	Pro	Ile	Asn	Ala	Leu	Ser	Asn	Ser	Leu	Leu	
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Arg	His	His	Asn	Leu	Val	Tyr	Ser	Thr	Thr	Ser	Arg	Ser	Ala	Cys	Gln	
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Arg	Gln	Lys	Lys	Val	Thr	Phe	Asp	Arg	Leu	Gln	Val	Leu	Asp	Ser	His	
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Tyr	Gln	Asp	Val	Leu	Lys	Glu	Val	Lys	Ala	Ala	Ala	Ser	Lys	Val	Lys	
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Ser	Ala	Lys	Ser	Lys	Phe	Gly	Tyr	Gly	Ala	Lys	Asp	Val	Arg	Cys	His	
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Ala	Arg	Lys	Ala	Val	Thr	His	Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu	
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Glu	As															

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Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu			
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Tyr Asp Val Val Thr Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr			
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Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala			
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Trp Lys Ser Lys Lys Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys			
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ttt gac tcc aca gtc act gag agc gac atc cgt acg gag gag gca atc			16935
Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile			
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tac caa tgt tgt gac ctc gac ccc caa gcc cgc gtg gcc atc aag tcc			16983
Tyr Gln Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser			
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Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly			
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Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr			
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agc tgt ggt aac acc ctc act tgc tac atc aag gcc cgg gca gcc tgt			17127
Ser Cys Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys			
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cga gcc gca ggg ctc cag gac tgc acc atg ctc gtg tgt ggc gac gac			17175
Arg Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp			
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Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser			
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ctg aga gcc ttc acg gag gct atg acc agg tac tcc gcc ccc cct ggg			17271
Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly			
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gac ccc cca caa cca gaa tac gac ttg gag ctc ata aca tca tgc tcc			17319
Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser			
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Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr			
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Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr	
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Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe	
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Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser	
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Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile	
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Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile	
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Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro	
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ccc ttg cga gct tgg aga cac cgg gcc cgg agc gtc cgc gct agg ctt	17751
Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu	
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ctg gcc aga gga ggc agg gct gcc ata tgt ggc aag tac ctc ttc aac	17799
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Gln Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp	
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Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys	
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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp	
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<223> Description of Artificial Sequence:

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<400> 19

Met	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro
1				5					10					15	

Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His
				20				25					30		

Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly
		35						40					45		

Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly  
 50 55 60  
 Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser  
 65 70 75 80  
 Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala  
 85 90 95  
 Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
 100 105 110  
 Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser  
 115 120 125  
 Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val  
 130 135 140  
 Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys  
 145 150 155 160  
 Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala  
 165 170 175  
 Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val  
 180 185 190  
 Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe  
 195 200 205  
 Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe  
 210 215 220  
 Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp  
 225 230 235 240  
 Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro  
 245 250 255  
 Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe  
 260 265 270  
 Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr  
 275 280 285  
 Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn  
 290 295 300  
 Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly  
 305 310 315 320  
 Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr  
 325 330 335  
 Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu Val Ala Tyr Gln Ala Thr  
 340 345 350

Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	355	360	365	
Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	370	375	380	
Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Ile	Thr	Leu	Thr	His	Pro	385	390	395	400
Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	405	410	415	
Thr	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	420	425	430	
Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val	Ile	Val	Gly	Arg	Val	Val	Leu	435	440	445	
Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	450	455	460	
Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser	Gln	His	Leu	Pro	Tyr	Ile	Glu	Gln	465	470	475	480
Gly	Met	Met	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Leu	Gly	Leu	Leu	485	490	495	
Gln	Thr	Ala	Ser	Arg	Gln	Ala	Glu	Val	Ile	Ala	Pro	Ala	Val	Gln	Thr	500	505	510	
Asn	Trp	Gln	Lys	Leu	Glu	Thr	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	515	520	525	
Ile	Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	530	535	540	
Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ala	Val	Thr	Ser	Pro	545	550	555	560
Leu	Thr	Thr	Ser	Gln	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	565	570	575	
Ala	Ala	Gln	Leu	Ala	Ala	Pro	Gly	Ala	Ala	Thr	Ala	Phe	Val	Gly	Ala	580	585	590	
Gly	Leu	Ala	Gly	Ala	Ala	Ile	Gly	Ser	Val	Gly	Leu	Gly	Lys	Val	Leu	595	600	605	
Ile	Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	610	615	620	
Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu	Val	Pro	Ser	Thr	Glu	Asp	Leu	Val	625	630	635	640
Asn	Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	645	650	655	

Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala  
660 665 670  
Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His  
675 680 685  
Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val  
690 695 700  
Thr Ala Ile Leu Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu  
705 710 715 720  
His Gln Trp Ile Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp  
725 730 735  
Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys  
740 745 750  
Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe  
755 760 765  
Val Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile  
770 775 780  
Met His Thr Arg Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys  
785 790 795 800  
Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp  
805 810 815  
Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro  
820 825 830  
Leu Pro Ala Pro Asn Tyr Thr Phe Ala Leu Trp Arg Val Ser Ala Glu  
835 840 845  
Glu Tyr Val Glu Ile Arg Gln Val Gly Asp Phe His Tyr Val Thr Gly  
850 855 860  
Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln Val Pro Ser Pro Glu  
865 870 875 880  
Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro  
885 890 895  
Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His  
900 905 910  
Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val  
915 920 925  
Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu  
930 935 940  
Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Val Ala Ser  
945 950 955 960



Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr  
 965 970 975  
 Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu  
 980 985 990  
 Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn  
 995 1000 1005  
 Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp  
 1010 1015 1020  
 Glu Arg Glu Ile Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg  
 1025 1030 1035 1040  
 Phe Ala Gln Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro  
 1045 1050 1055  
 Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His  
 1060 1065 1070  
 Gly Cys Pro Leu Pro Pro Pro Lys Ser Pro Pro Val Pro Pro Pro Arg  
 1075 1080 1085  
 Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu  
 1090 1095 1100  
 Ala Glu Leu Ala Thr Arg Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile  
 1105 1110 1115 1120  
 Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys  
 1125 1130 1135  
 Pro Pro Asp Ser Asp Ala Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu  
 1140 1145 1150  
 Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val  
 1155 1160 1165  
 Ser Ser Glu Ala Asn Ala Glu Asp Val Val Cys Cys Ser Met Ser Tyr  
 1170 1175 1180  
 Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys  
 1185 1190 1195 1200  
 Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu  
 1205 1210 1215  
 Val Tyr Ser Thr Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val  
 1220 1225 1230  
 Thr Phe Asp Arg Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu  
 1235 1240 1245  
 Lys Glu Val Lys Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser  
 1250 1255 1260

Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys  
 1265 1270 1275 1280  
 Phe Gly Tyr Gly Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val  
 1285 1290 1295  
 Thr His Ile Asn Ser Val Trp Lys Asp Leu Leu Glu Asp Asn Val Thr  
 1300 1305 1310  
 Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln  
 1315 1320 1325  
 Pro Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp  
 1330 1335 1340  
 Leu Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Thr  
 1345 1350 1355 1360  
 Lys Leu Pro Leu Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser  
 1365 1370 1375  
 Pro Gly Gln Arg Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys  
 1380 1385 1390  
 Thr Pro Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val  
 1395 1400 1405  
 Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp  
 1410 1415 1420  
 Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu  
 1425 1430 1435 1440  
 Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr  
 1445 1450 1455  
 Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr  
 1460 1465 1470  
 Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu  
 1475 1480 1485  
 Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys  
 1490 1495 1500  
 Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr  
 1505 1510 1515 1520  
 Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro  
 1525 1530 1535  
 Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val  
 1540 1545 1550  
 Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro  
 1555 1560 1565

Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro  
 1570 1575 1580  
 Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp  
 1585 1590 1595 1600  
 Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg  
 1605 1610 1615  
 Asp Gln Leu Glu Gln Ala Leu Asp Cys Glu Ile Tyr Gly Ala Cys Tyr  
 1620 1625 1630  
 Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly  
 1635 1640 1645  
 Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg  
 1650 1655 1660  
 Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp  
 1665 1670 1675 1680  
 Arg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ala Arg Gly Gly  
 1685 1690 1695  
 Arg Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr  
 1700 1705 1710  
 Lys Leu Lys Leu Thr Pro Ile Ala Ala Ala Gly Gln Leu Asp Leu Ser  
 1715 1720 1725  
 Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val  
 1730 1735 1740  
 Ser His Ala Arg Pro Arg Trp Ile Trp Phe Cys Leu Leu Leu Leu Ala  
 1745 1750 1755 1760  
 Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg Met Ser Thr Asn Pro  
 1765 1770 1775  
 Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp  
 1780 1785 1790  
 Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val Tyr Leu Leu  
 1795 1800 1805  
 Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala Thr Arg Lys Thr Ser  
 1810 1815 1820  
 Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys Ala Arg  
 1825 1830 1835 1840  
 Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly Tyr Pro Trp Pro Leu  
 1845 1850 1855  
 Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp Leu Leu Ser Pro Arg  
 1860 1865 1870

Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro Arg Arg Arg Ser Arg  
1875 1880 1885

Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys Gly Phe Ala Asp Leu  
1890 1895 1900

Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu Gly Gly Ala Ala Arg  
1905 1910 1915 1920

Ala